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18 November 1981

Worldwide Report

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

No. 189

FBIS FOREIGN BROADCAST INFORMATION SERVICE

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TROPOSCATTER LINK ESTABLISHED FOR USSR, INDIA

BK031342 Delhi General Overseas Service in English 1010 GMT 3 Nov 81

[Commentary: "New Link Between India and Russia" by N.R. Verma of the All India Radio]

[Excerpts] India and Russia have taken a giant step in history, both in terms of distance and time, by establishing the world's first-ever troposcatter communication link. Troposcatter is the method of utilizing two mountain tops for defracting radio beams sent by ground stations, thus avoiding unforeseen interruptions due to atmospheric disturbances in high altitudes.

The setting up of the new link between the two countries has raised Indo-Soviet relations to new heights in technological collaboration. While inaugurating the new link on Monday last [2 November] Prime Minister Mrs Indira Gandhi rightly pointed out that it is an important milestone in Indo-Soviet economic, scientific and technological cooperation. She said India deeply appreciates the Soviet Union sharing with us its technology for the benefit of both our people. She also congratulated the Soviet engineers and technicians who had jointly worked in achieving this impressive technological feat.

Though the relations between the two countries have grown in the last 3 decades and they are comprehensive today, there was no adequate direct communication link between the two countries. A good part of the communication went through London and Tokyo. It was to remove this anomaly that the two countries decided to establish a troposcatter link during Soviet President Brezhnev's visit to India in 1973. An agreement for establishing the link was signed in 1977 when Soviet Foreign Minister Gromyko visited Delhi.

The tropospheric communication line is a joint Indo-Soviet venture. The Soviet Union supplied the design project and special equipment. The state-owned electronic corporation of India manufactured two sets of big antenna. The receiving and transmitting stations are located at (Samlok) Mountain near Drusanre, the capital of Soviet Tadzhikstan and the village (Sherare Sharif), 23 kilometers from Srinagar, capital of the norhternmost Indian state of Jammu and Kashmir.

There was great need for establishing better communication with the Soviet Union in view of the growing bilateral cooperation. The existing shortwave communication link between the two countries was not able to meet these requirements in full. Being subject to atmospheric disturbances a shortwave communication link was also not stable and reliable. Therefore, the new link has gone a long way in meeting this need.

The troposcatter link will now provide a reliable round the clock high quality transmission medium for telecommunication services. It will also effectively supplement the route at present available through Intersat global satellite communication system. Another highlight is that it will serve as a strategic diversity medium during the contingencies, such as a planned and unforeseen interruption in the satellite communication system.

The troposcatter link will be utilized not only for telecom traffic between the two countries but also between East Europe and India. In addition, it will carry traffic from Southeast Asia to the Soviet Union and East Europe and thus open up new vistas of cooperation and understanding with all the friendly neighboring countries.

CSO: 5500/2034

BRIEFS

DW, PRC RADIO AGREEMENT--Cologne/Bonn, 4 Nov (DPA)--Deutsche Welle and Beijing Radio intend to exchange journalists. An agreement to this effect was signed today by Klaus Schuetz, director of the Federal Republic's Foreign Broadcasting Station, and Chinese Ambassador in Bonn Zhang Tong, Deutsche Welle reports. The Cologne radio station has been broadcasting in Chinese since 1965, while Beijing Radio began its German program 5 years earlier. [Text] [LD041100 Hamburg DPA in German 0938 GMT 4 Nov 81]

PRC, ITALY BROADCAST AGREEMENT--Beijing, 6 Nov (XINHUA)--The Broadcasting Administration of the People's Republic of China and the Italian Radio and Television signed an agreement on radio and television cooperation here this afternoon. The agreement was signed by Zhang Xiangshan, director of the Central Broadcasting Administration of China, and Sergio Zavoli, chairman of the board of the Italian Radio and Television. Under the agreement, both sides will cooperate in the fields of radio and television and exchange programs about science, culture, sports, current events, youth and children in the principle of equality and mutual benefit and in the spirit of friendship and mutual understanding. The two sides will also exchange visits and reporting groups. In the evening, Zhang Xiangshan gave a banquet to welcome the Italian guests and celebrate the signing of the agreement. [Text] [OW061620 Beijing XINHUA in English 1524 GMT 6 Nov 81]

CSO: 5500/2034

BOOM IN TELEX SERVICES, CUSTOMERS EXPECTED BY TELECOM

Canberra THE AUSTRALIAN in English 5 Oct 81 p 16

[Text] TELECOM Australia is expecting the number of telex customers in Australia to double by the turn of the century.

Telecom expects the number of subscribers, at present 33,000, to swell to more than 700,000 by the year 2000.

Telex is already one of Telecom's most rapid growth sectors.

To meet the expected increase in telex demand, Telecom will introduce fully electronic SPC (stored program controlled) telex exchanges.

At present the 33,000 customers in the Australian telex network make 40 million calls a year, of which more than 8.5 million go overseas.

The number of telex services has doubled in the past five years. Every year 9000 new connections are made.

One cause of this is the growing number of small businesses and private individuals using telex facilities.

Telex customers who specifically request the broader range of facilities will be among the first to be connected to the new SPC telex exchanges.

SPC telex, when it is introduced, will initially provide six new facilities for customers. Telecom intends to add further facilities later.

One of the big improvments planned for the introduction is the ability to make automatic conference and broadcast calls. Customers will be able to connect up to 16 parties using an SPC telex automatic conference or broadcast call.

The number of parties which can be called may be increased at a later date.

Previously, such calls had to be put through manually.

Other features of the new SPC system are:

- AUTOMATIC insertion of time and date.
- CHANGEABLE time of clearing
- ABBREVIATED calling of frequently used numbers.
- GROUP address codes for conference or broadcast calls.
- A telex "hot line."

Hot lines are direct connections between two points. No dialling is involved, and messages sent from one of the points will be receieved immediately at the other, and vice versa.

The two facilities Telecom intends to add later are delayed delivery of calls and redirection of calls.

Delayed delivery allows messages to be stored while a called party is busy or where a message must be sent at a particular time.

The first automatic confernece and broadcast calls will be made through Melbourne from next June. A full SPC telex service will be provided by November, 1982.

The main Sydney telex exchange is at present overloaded, but the congestion will be relieved with a cutover of a second similar exchange this month.

By June, 1983, SPC exchanges will have been commissioned in Sydney and Brisbane, as well as Melbourne.

By 1984 Sydney will have an additional 4000 lines.

When SPC telex is introduced in NSW, users who are at present connected to the smaller Canberra, Newcastle and Wollongong exchanges will be connected directly to the Sydney SPC telex exchange.

The new exchanges are a far cry from the manual telex service introduced into Australia in 1954. The first fully automatic service was connected in 1966.

Ten years later Telecom introduced a new generation teleprinter which made full use of microprocessor technology.

In the next few years Telecom expects to reduce its telex maintenance costs by half as a result of the changeover.

Telecom says the economies achieved with these new terminals is being passed on to telex users.

Call charges, particularly for automatic telex calls over long distances last year, were reduced.

CSO: 5500/7507

BRIEFS

SUBMARINE CABLE CONTRACT--Sydney--A $277 million order for the major part of an underseas telecommunications cable system linking Australia, New Zealand and Canada has been won by the submarine systems division of Standard Telephones and Cables of London. The contract was announced by the Federal Minister for Communications, Mr Sinclair, in Sydney yesterday. Australia's commitment, through the Overseas Telecommunications Commission, to the ANZCAN project is about $200 million out of a total of $400 million. The 15,000km communications cable will pass from Sydney through Norfolk Island, Fiji, and Hawaii to Vancouver. It is expected to be operational by 1984. Mr Sinclair said the cable would complement the satellite systems operated by Intellsat. STC Sydney, a telecommunications and electronics company, will be responsible for generating $78 million worth of high technology manufacturing in Australia as part of the submarine project. Mr Sinclair also announced that the Nippon Electric Co. of Japan had won a $30 million contract for a 1370km cable between Norfol Island and Auckland. [Text] [Perth THE WEST AUSTRALIAN in English 3 Oct 81 p 7]

CSO: 5500/7507

MALAYSIA

BRIEFS

ASIA-PACIFIC NETWORK LAUNCHED--The Asia-Pacific News Network was officially launched by the minister of information, Datuk Mohamed Rahmat, in Kuala Lumpur this evening. The network will heop promote a better understanding among the people in the region and correct imbalances in information flow. Twenty-three news agencies in the Asia-Pacific area are taking part in the scheme which will be fully operational next year. Earlier, in closing the fifth General Assembly of the Organization of Asia-Pacific News Agencies, OANA, Datuk Mohamed Rahmat stressed that the newly launched news network must not only exist but it should strive to fulfill the aspirations of its members. They must not only be great of quantity and circulation of news concerning this region but these had also to be accurate and relevant. He pointed that there was a need to insulate the Asian readership from the distorted news circulated especially by the Western media. At today's meeting, delegates adopted several recommendations. They included guidelines for editorial operations of the news network and training for journalists. Another recommendation was to encourage transnational news agencies to distribute their services only through national news agencies. The next general assembly will be held in New Delhi in 1984. Encik (Ahmad Mustafa Hassan) of Bernama was elected president of OANA. [Text] [BK061353 Kuala Lumpur Domestic Service in English 1130 GMT 6 Nov 81]

CSO: 5500/2034

BRIEFS

SATELLITE IN 6 YEARS--Karachi, Oct 19--Pakistan would be capable to launch its own satellite within 5 to 6 years for which 2,500 competent personnels including scientists, engineers and skilled workers would be required. This was revealed by the Chairman, Space and Upper Atmosphere Research Commission (SUPARCO), Mr Salim Mehmood, while delivering his lecture at the University of Engineering and Technology here today. He said that this University has all the talents, in its students, which would be needed in launching a satellite. He further said that a first class electronics laboratory has been set up by the SUPARCO for the analysis and interpretation of pictures to be received from the satellites. The facilities established by SUPARCO will help analysed data from the firing of rockets while they are in flight, he said. The engineers and scientists who would be joining the organisation are free to join and free to go and they are not required to submit security bonds, he assured. [Text] [Lahore THE PAKISTAN TIMES in English 20 Oct 81 p 1]

CSO: 5500/4510

BRIEFS

FUJIAN BROADCASTING FACILITIES--Jianning County, Fujian Province, spent 40,000 yuan in relocating its television transmission station on the Tiantai mountains some 1,300 meters above sea level. This improves the television reception at most communes and production brigades. Another 20,000 yuan were used to support the maintenance work on wire broadcasting facilities at various communes and production brigades. [OW020933 Fuzhou Fujian Provincial Service in Mandarin 1120 GMT 31 Oct 81]

CSO: 5500/4002

COMMUNICATIONS PROGRAM SET TO BEGIN NEXT YEAR

SK040259 Seoul YONHAP in English 0245 GMT 4 Nov 81

[Text] Seoul, 4 Nov (YONHAP)--South Korea will spend about 6.1 trillion Korean won (U.S.$9 billion) to finance a long-term communications program to be implemented during the country's fifth 5-year economic and social development plan beginning next year, the Communications Ministry here announced Wednesday.

Of the projected 6.1 trillion won investment, ministry officials said, 70 percent will go to the expansion of intra-city telephone circuits, 20 percent to the intercity telephone network and 10 percent to telegraph and international communications facilities.

The communications program calls for 4.3 trillion won (about $6,143 million) over the next 5 years, to increase the number of telephone circuits by 2.5 times to 9,231,000 intra-city telephone lines across the country, and lift the telephone supply rate against the demand rate to 97.2 percent, vs. the present rate of 76.2 percent.

When the communications program is completed by 1986, there will be 19.3 telephone lines per 100 people; the present rate is 8.9 percent.

Ninety-eight percent of telephones will be operated by automatic switching systems, and 62 percent will be connected to electronic switching systems (ESS) by the end of the 5-year period, the officials said.

Full automatic telephone calls to 24 nations, including the United States, Japan and the United Kingdom, around the world will be possible from Seoul by the end of 1983, and from Pusan by 1985, for which 5.2 billion won (about $7.5 million) has been earmarked.

The officials also said that the country will build the fourth earth station for the Pacific international telecommunications satellite by 1985 with a total cost of 8.6 billion won (about $12.3 million).

The No 4 station, which will replace the old No 1 station, will provide more satellite telecommunication services, icnluding live television coverage of major events happening around the world.

The officials said that the communications program is also part of a communications-support plan for the 1988 summer olympic games in Seoul.

CSO: 5500/2034

CZECHOSLOVAK PRESS BUREAU'S ADVANCED TECHNOLOGY NOTED

Bratislava PRACA in Slovak 19 Sep 81 pp 1, 7

[Article by Zuzana Mlada and Vladimir Hudak: "From Tin Can To Display"]

[Excerpts] At Present: Almost 5 Million Lines of Information Annually

This Monday we shall celebrate a holiday...the day of the CTK. Every reader is familiar with these three letters which hide the words CZECHOSLOVAK PRESS AGENCY, or more precisely, its 1,600 employees, and even more precisely, its 380 domestic and 23 foreign editors, administrative employees, technicians...who every day supply editorial offices with 500 pages of political, economic, sports, cultural and other information and interesting news from our country and abroad.

The Beginnings

In the beginning of World War I an organ of the Czech and Slovak emigration in the United States was established in Washington; even then it used the current abbreviation--CTK. The CZECH PRESS BUREAU was founded in London 2 years later and later the CZECHOSLOVAK TELEGRAPH AGENCY was organized in Russia.

However, the official birth certificate of the CTK indicates 28 October 1918 as the date when, after the declaration of an independent republic, the presidium of the National Committee for Press Information established a news agency which signed its dispatches with the abbreviation CTK.

During the first hours only several enthusiasts were working there, but 2 days later its editors were officially appointed and at the same time, the press informed the public that "...the CZECHOSLOVAK PRESS BUREAU--starting tomorrow--will supply newspapers with information about the political, economic, social and other activities of the Czechoslovak nation and its institutions. This bureau and its information must be carefully distinguished from the imperial-royal correspondence agency, a semi-official Viennese institution, and its branch office in Prague, which provides now, as it had before and during the war, information to newspapers at regular subscription charges. We request that editorial offices distinguish the information by identifying the information supplied by the correspondence bureau by initials KK and the information provided by the CZECHOSLOVAK PRESS BUREAU by initials CTK."

Briefly About the Present

We obtained the preceding information about the history of the CTK very rapidly in one of its six editorial departments--documentation. (The others are: international, political, information for foreign consumption, economic and pictorial.) It was Drahos Lustig, the deputy central director of the CTK in Prague, himself who with his colleagues provided us with the recent data--concerning present operations. From their information, we selected some which to us seemed the most interesting. One of the principles of information service agency is brevity; for that reason and with that in view, here are the replies to the question: "Do you know that the CTK":

--is cooperating with every world press agency (TASS, Reuter, AFP, UPI, AP) from which it receives complete service and with which it maintains continuous 24-hour contact;

--signed agreements on bilateral information exchange with an additional 52 national press agencies with which it maintains periodical daily contact;

--in addition to 23 foreign correspondents, has 90 correspondents in more remote areas;

--its most distant coorespondents are--in one direction--Jaroslav Hoeffer in China, and in the other--Karol Filek in New York;

--has one female foreign correspondent--Ilona Kovarikova in Cuba;

--publishes 15 political and economic bulletins and periodicals, the most interesting of which are HOSPODARSKE INFORMACIE ZO ZAHRANICIA [Foreign Economic Information], SVET HOSPODARSTVI [World of Economics], VEDA A TECHNIKA V ZAHRANICI [Science and Technology Abroad], and 100 + 1 ZAHRANICNA ZAUJIMAVOST [One Hundred and One Foreign Items of Interest];

--provides almost 5 million lines of information annually to editorial offices;

--maintains editorial offices in every kraj of our republic and in addition, has seven branches--in Karlovy Vary, Liberec, Olomouc, Gottwaldov, Presov, Zilina and Poprad;

--provides information for all daily and many weekly publications, radio and television;

--its activities "consume" Kcs 270 million annually;

--is headquarters for dispatch of PHOTO INTERNATIONAL pictorial information from the socialist states, through which pass all photographs exchanged by socialist agencies.

Revolution in Technology

In addition, Lustig disclosed that the electronic automated news-processing system introduced in three editorial offices (political, international and information for foreign consumption) on 1 January 1981 means revolution in current technology. (For example, 50-digit teletypes were replaced by 200-digit transtels.) The objective is speed. A year ago it still took 12 hours to dispatch a 100-page address (which is approximately the scope of the report presented by L. I. Brezhnev to the 26th CPSU Congress), today it takes 3 hours.

Comrade Lustig says: "In terms of technological equipment, we have thus reached the level of world agencies, and it should be underscored that we are the first socialist bureau to begin dispatching and receiving information to such an extent by means of display technology and microcomputers. Beginning this year, our editors are using in their work television screens, the so-called display, instead of teletypes and typewriters. And microcomputers control the whole flow of information, its processing, arrangement and dispatch in our editorial offices in the CSSR and abroad."

The new system accelerates information processing several times, speeds up dispatch of information four times, and saves workforces. Moreover, this electronic automated system facilitates direct connection of editorial offices with high-speed typesetters for automatic composition. For example, RUDE PRAVO printed in this manner every document of the 26th CPSU Congress and of the 16th CPCZ Congress. Thus, as it appears, our new technology "saves" workforces not only to our own benefit but also to the benefit of editorial offices and printing shops.

"All this modern equipment was assembled and most of it also manufactured by the department of telecommunications of the CTK," said the comrade deputy director in conclusion. The technicians added that this was not their last word. It is envisaged that further acceleration will dispatch up to 300 digits, but this will need the construction of new, better means of communication--as well as time.

PHOTO CAPTIONS

1. View of the office of international department.

2. Modern displays replaced teletypes.

3. Dispatching for reception and tranmission of pictorial information.

9004
CSO: 5500/3001

PAY TV DRAWS CLOSER AFTER GOVERNMENT POLICY CHANGES

Hamilton THE ROYAL GAZETTE in English 15 Oct 81 pp 1, 2

[Text]

Starvision hopes to have a subscription television station on the air by the first quarter of next year after Government amended conditions to its television policy, company president Mr. Arnold Francis said yesterday.

And in defence of the concessions made by Government, the Hon. John Swan, Minister of Home Affairs, said they were only of a minor nature and did not alter the philosophy of Government's policy towards the television industry.

"We made an applicaton to the Ministry of Home Affairs last week," said Mr. Francis. "We have been assured that some conditions set out initially have been amended to the point where we feel a station would be workable."

The major conditions amended included:

- A relaxation of a requirement that no advertisements be broadcast on a subscription television station.
- A ten percent levy on revenues was reduced to what is understood to be a nominal and acceptable flat-rate annual fee.
- Programmes would not have to be approved on an individual basis at first envisaged, but on a basis similar to the existing two television stations.

"All things being equal we hope to be operative by the first quarter of next year," said Mr. Francis.

He added, however, that there were still final points to be clarified. One was a requirement that all station use a common transmission tower. It is now thought that this requirement has been dropped.

Mr. Swan said that none of the amendments were of a major nature.

"The philosophy is still there. We are trying to deal with the practical realities in not introducing any impediments to the devenpment of on-air transmission," Mr. Swan said.

In confirming the amendments to the conditions, Mr. Swan pointed out that subscription television stations would still not be permitted to carry local advertisements.

But, in cases where televised programes were sponsored by foreign advertisers, subscription television stations would not have to erase such advertisements.

"We pointed out that eradicating the advertisements would defeat our purpose in bringing to the Island live events, because we would have to spend time cutting out the advertisements," said Mr. Francis.

Mr. Swan said it was decided to drop the 10 percent levy because it was considered inflationary.

Regarding approval for individual programmes, it was felt the new stations would exert discretion within guidelines of good taste subject to final decisions by the Broadcasting Commissioners.

Meanwhile ZBM station manager, Mr. Bryan Lodge had "no comment" in response to a Tuesday report that the Bermuda Broadcasting Company, which operates ZBM, had applied for a cable television station licence.

The report added a claim that the company had applied through an American firm to the U.S. Federal Communicatons Commission for permission to relay television programmes to Bermuda via satellite.

When asked if ZBM would comment at a later date Mr. Lodge said: "We do not anticipate making av comment in the future."

CSO: 5500/7506

TIGHTENED TV CONTROLS PROPOSED FOR GOVERNMENT APPROVAL

Hamilton THE ROYAL GAZETTE in English 16 Oct 81 p 1

[Text]

Broadcasting Commissioners recommended tougher controls yesterday in an attempt to improve the quality of Bermuda television.

In agreement with both ZBM and ZFB, the Commission has tightened up existing regultions which date back to 1971 and will now put its proposals to the Minister for Home Affairs.

Said Commission chairman Mr. Robert Stewart: "We are of the opinion that the public are not all that satisfied by the service from the television stations.

"We recognise that Bermuda is a small market and highly dependent on the United States networks of ABC and CBS but there is nevertheless some ability for discretion to be shown."

Two areas of most concern to the Commission were the lack of educational and cultural programmes and the current "haphazard" starting times of shows.

The 1971 controls specified that the stations should broadcast programmes of a minority, cultural or educational interest for at least one fifth of the time between 6 p.m. and 11 p.m.

"The problem is that it is difficult to define these terms," said Mr. Stewart. "We have re-written the old regulations to sharpen up the definitions."

Another Commission recommendation is that programmes should start at the published time.

"We have also recommended that for the hours between 4 p.m. and 5.30 p.m. stations should do their best to present children's programmes. And from 5.30 p.m. to 7.30 p.m. we would like either family programmes or locally produced shows."

The Commission will meet with the Attorney General next week to discuss the proposals before the package is then passed on to the Minister of Home Affairs.

If accepted the regulations will then go to the House of Assembly.

The regulations carry a penalty of a maximum $1,000 fine for offenders.

The Commission is also seeking clarification of the law on video tapes from the Attorney General.

"We want to see what legislation there is, if any, regarding the renting of videos," said Mr. Stewart.

CSO: 5500/7506

BRIEFS

CSSR TELEVISION AGREEMENT--Jan Zelenka, director general of Czechoslovak Television, and Nivaldo Herrera, president of the Cuban Institute for Radio and Television, have signed a protocol in Havana on cooperation in 1982-1983. The protocol provides for exchange of programs, reports and news items on the economic, cultural and social development of Czechoslovakia and Cuba. The protocol also outlines technological aid to be given to Cuban television by Czechoslovak television. A clause on coproduction activity of the two television services is one of the most important sections of the protocol. [Text] [Prague Domestic Television Service in Czech and Slovak 1830 GMT 3 Nov 81 LD]

CSO: 5500/2035

BRIEFS

CLOSING OF 'MI RADIO' PROTESTED--The Dominican Association of Radio-Broadcasters, ADORA, last night rejected the procedure used by the General Directorate of Telecommunications to close down the radio station "Mi Radio." ADORA argues that if there is a violation of the law, whatever its nature, there are established mechanisms to air out any problem. ADORA notes that the Dominican Government considers the rule of law as the present administration's main achievement. In the case of "Mi Radio," ADORA believes that the telecommunications director's actions contradict this claim. In a communique signed by ADORA President (Jose Eduardo Felix), the association says that it does not agree with the telecommunications director's statement that radio and television frequencies belong to the state. ADORA says that there are no laws awarding that right to the state; in accordance with international law, the sole owner of frequencies is the international community. [Excerpt] [FL111702 Santo Domingo Radio MIL Network in Spanish 1000 GMT 11 Nov 81]

CSO: 3010/257

FOURTH PHASE OF SATELLITE STATION TO START SOON

Jiddah AL-MADINAH in Arabic 27 Jul 81 p 3

[Interview with Dr Alawi Darwish Kayyal, Minister of Post, Telegraph, by AL-MADINA: "Eighteen Thousand Car Telephones Within 2 Years"; place and date not specified]

[Text] Telephone, telegraph, and telex communications in Saudi Arabia are evidence of the great efforts undertaken by the Ministry of Post, Telephone and Telegraph in order to improve the standard of services of these public utilities. As a result of these efforts the Kingdom has come to the forefront in this field. Because the government, at the instructions of his excellency, the beloved King, has utilized a large part of its resources to strengthen the above-mentioned services, the Ministry of Post, Telephone and Telegraph has profited from the opportunity to make the dream of each citizen come true. These services represent, of course, one of the first steps toward modern civilization in our country. Bearing this in mind, AL-MADINA conducted the following interview with his excellency, the minister of Post, Telephone and Telegraph, Dr Alawi Darwish Kayyal. His excellency talked to us about many important projects which the ministry is carrying out.

The Fourth Phase

[Question] Your excellency, what has the ministry achieved during the Fourth Phase concerning satellites in the Kingdom, and where will that phase be completed?

[Answer] Soon the plan for the Fourth Phase concerning a satellite station will be presented. This plan will be carried out in Jiddah, and it will include 1,000 disks. Approximately 2 years will be spent on that plan, which when completed, will enable the Kingdom to communicate with all the continents of the world.

One Thousand Disks

[Question] By the end of the Fourth Phase how many satellite disks will there be in the Kingdom?

[Answer] At the end of the Fourth Phase to be carried out in Jiddah, there will be 3,000 disks in the following cities: Riyadh, Jiddah and Ta'if where there is now a satellite disk.

Five Thousand Lines

[Question] How many telephone lines were installed during the Second Five-Year Plan carried out by the ministry?

[Answer] The Ministry of Post, Telephone and Telegraph undertook the installation of 5,000 telephone lines during the second plan.

[Question] How about the third plan your excellency?

[Answer] The installation of 280,000 telephone lines in the Kingdom is included in the third plan of the ministry. These lines will be used in 250 cities and villages throughout the Kingdom.

One Million Lines

[Question] What is the number of lines in service in the Kingdom, and what will it be at the end of the third plan?

[Answer] At the present time, the number of lines in service is 630,000. By the end of the third plan that number will reach approximately 1 million.

[Question] What are the new plans for telephones that will soon be completed?

[Answer] At the end of next month, the telephone office of Moshrifa in Jiddah will be completed. This office will have 10,000 lines and a capacity for 30,000. When needed, new lines can be added. The above-mentioned office will service the whole region of al-Makruna street in Jiddah.

Car Telephones

[Question] Your excellency, what are the plans of the ministry regarding the expansion of an automatic telephone network for cars?

[Answer] Two years from now, 18,000 car telephone systems will be installed to service 30 cities in the Kingdom. With this plan and the help of God, we will be able to answer all needs concerning car telephones.

[Question] Your excellency, taking into consideration the economic status of the Kingdom, the need has become pressing to increase telex communications. What are the plans of the ministry in regard to expand telex service in the Kingdom?

[Answer] Currently, there are 10,000 telex lines in the Kingdom. During the Third Five-Year Plan 15,000, with capacity for expansion, will be installed. That will bring the number of telex lines to approximately 30,000 lines by the end of the plan.

The Main Preparations

[Question] In order to meet the continuous expansion of the various services of the Ministry of Post, Telephone and Telegraph, what plans has the ministry adopted in that regard?

[Answer] According to an agreement made with the Ministry of Planning, the Ministry of Post, Telephone and Telegrapn is to carry out all main preparations for its plans in order to face any problems concerning projects completions. Included in the ministry plans are of course excavation and construction of above ground and underground rooms.

Labor

[Question] Among the ministry's concerns is training Saudi labor in wire and wireless communications. Did the training institutions in both Jiddah and Riyadh succeed in furnishing this kind of labor?

[Answer] The ministry had undertaken the responsibility of developing national talents in order to achieve self-sufficiency by having Saudi technicians. Without a doubt the ministry training institutions had taken part in graduating a group of Saudi youth capable of assuming responsibility. The diploma, which is conferred by the center upon qualification is equal to a high school diploma. Two hundred and thirty students will be graduating in the next few months in all fields of wire and wireless communications. The ministry has provided great facilities to the students such as housing, bonus, and high level of qualified instructors in science.

Periodic Meetings

[Question] How can the ministry solve the problems that face the companies carrying out the projects?

[Answer] At approximately the end of each month, a meeting is held in my office. Attending are ministry officials and a number of presidents and officers of the companies carrying out the projects. The purpose of the meeting is to discuss the difficulties facing those companies as they continue their work such as securing labor. Coordination is also under way among the companies concerning the interlinking of ministry projects, so that the companies cannot have any excuses for not completing the contracts. These meetings, without doubt, have contributed to solving many problems presented by the officials of the ministry and of the companies that are carrying out the projects of the Ministry of Post, Telephone and Telegraph.

CSO: 5500/4732

BRIEFS

'ANA'-'JANA' AGREEMENT--Aden, 5 Nov (ANA)--An agreement for a joint program of action between Aden News Agency (ANA) and the Libyan Jamahiriyah News Agency (JANA) was signed today at ANA's headquarters. It was signed by Najib Muhammad Ibrahim, director of ANA, and by 'Abd al-Salam 'Ali Ashur, member of the People's Committee of the Libyan Brotherhood Bureau in Aden. The agreement provides for the exchange of news about political events and economic and social achievements in the two fraternal countries and the distribution of such news to official information media in the two countries. It also provides for constant coordination between the two agencies on the information stance to be adopted vis a vis the crucial issues facing the Arab nation and their place in world politics as well as on regional issues so as to refute successfully the fabrications and concoctions of the enemies of the Arab nation and expose the hostile movements by the imperialist, Zionist and reactionary forces. [Text] [LD060320 Aden ANA in Arabic 1400 GMT 5 Nov 81]

CSO: 5500/2034

EGYPT

BRIEFS

MICROWAVE COMMUNICATIONS SYSTEM INSTALLED--Cairo, 8 Nov (MENA)--It has been decided to set up a nationwide microwave network to provide instant communications between all the centers of the Egyptian armed forces all over Egypt. This network guarantees the secrecy of communications among the armed forces in addition to removing problems arising from faulty cables. In tomorrow's issue, the MAY newspaper says that Egyptian army experts are currently studying the balloon system used by the United States to supervise its borders. The balloons gather information and send it to monitoring centers--similar to earth monitoring stations. The cost of establishing the balloon system is estimated at $80 million, while the radar equipped (?E-2C) planes, which we will receive from the United States, cost about $165 million per plane. The four planes for which we have signed a contract are not sufficient to cover our borders. However, if we establish the balloon system in addition to buying these planes, we will have a comprehensive monitoring system which will cover our entire border. [Text] [NC082027 Cairo MENA in Arabic 1952 GMT 8 Nov 81]

CSO: 5500/2034

MUSCAT-SALALAH DIRECT TELEPHONE LINK

Muscat 'UMAN in Arabic 26 Oct 81 p 1

[Article: "Development of Telephone Links in Southern Region, Direct Links Between Capital, Salalah by Next July, 8,700 Telephone Lines by End of Five-Year Plan"]

[Text] 'Abd-al-Rahman Sabti, head of the Department of Public Communications in Salalah has announced that work is presently underway to connect the southern region and the capital with direct telephone links. He said that the project would be completed by the second half of next year and that it would secure direct connections between the southern region and the capital as well as outside the Sultanate.

'Abd-al-Rahman Sabti stated in an interview with an 'UMAN correspondent that 4,200 lines had been set up in the southern region in recent years including 2,000 lines which have been completed since 1979.

He explained that there are two stages to the planned increase of lines in the southern region within the Second Five-Year Plan. This is to cope with the steady increase in the city of Salalah and surrounding villages. He said that the first stage includes setting up 2,000 telephone lines in Salalah, 200 lines in Raysut and 25 lines in Mirbat.

The second stage includes setting up 2,000 lines in Salalah. With this the number of lines in the southern region will reach 8,700 by the end of the Second Five-Year Plan.

Concerning the remaining villages, the Second Five-Year Plan calls for telephone exchanges in Thamarit and Sudh, each carrying 100 lines.

'Abd-al-Rahman Sabti indicated that studies are currently underway to determine the needs of the other areas within the southern region in preparation for measures to be taken there.

Concluding his interview he said that the department is exerting every effort to provide the citizenry with the best and most modern services without consideration for financial gain. In today's world providing the services is only a portion of the overall cost of the services. When the time comes to reconsider the costs we will not hesitate to lighten the public's burden.

CSO: 5500/4704

BRIEFS

EXPERIMENTAL TELEVISION--Maputo, 9 Nov (AFP)--About 10,000 people watched the first of Maputo's experimental weekly television programmes on private sets and in public viewing centres in the capital at the weekend, the official Mozambique News Agency, AIM, reported today. This is the third stage in Mozambique's experiment into television, which began in August 1979 with 40 days of programming. The second step was training staff and installing equipment in the station in Maputo. The experiment is expected to last until the end of 1982, when the government will decide whether to introduce permanent television. [Text] [AB091618 Paris AFP in English 1543 GMT 9 Nov 81]

CSO: 5500/5619

ISCOR STARTS UP ON-LINE COMPUTER SERVICE NETWORK

Johannesburg THE STAR in English 19 Oct 81 p 26

[Text] One of the most extensive and sophisticated on-line computer service networks is coming onstream for the mines of Iscor.

By the end of 1981 six powerful Prime superminis based at the northern Cape's Sishen iron-ore mine, the north-western Transvaal's iron-ore mines at Thabazimbi, the Ellisras open-pit coking-coal mine, and Natal's huge Durnacol underground colliery will be linked through Primenet to Iscor's data-processing centre in Pretoria.

IMPLEMENTED

A seventh Prime computer at Iscor's Newcastle works, where a graphics and a steel-rolling calibration application are being implemented, will also be hooked into the system at a later date. The networking project began in 1979 and the first minicomputer was installed in January 1980.

Mr Abie Fullard, manager of Iscor's mines-computer systems, said that mine-management skills and resources were being taxed not only by the magnitude of such schemes as the development of the Richards Bay coal and the Sishen-Saldanha iron-ore export projects but also by the sudden price fluctuations in overseas markets, the ever-increasing price of capital development, and the shortage of skilled manpower and environmental constraints.

The objective of Primenet was for the computer service to assist Iscor's mine managements in their decision-making. All the information needed by mine managements was on hand but there was increasing insistence that it be readily accessible in the right form at a time it was needed most.

A centralised DP system to serve mines so far flung was impracticable because the Post Office communications system in 1979 was not such that acceptable communication response times could be guaranteed, especially to distant sites such as Sishen and Ellisras.

NOT FEASIBLE

The alternative — total decentralisation — was also not feasible as each mine would have to have its own system, a call on manpower quite beyond Iscor's resources. Furthermore it was difficult to obtain and retain staff capable of, for example, "three-dimensional optimisation for pit-planning" at remote sites because people of this calibre and experience wished to remain near to the mainstream of technological development on the Witwatersrand.

Iscor chose distributive data processing strategy — keeping the full DP development in Pretoria but "decentralising processing horsepower" by siting minicomputers at the mines and manning these with data capturing and operations staff who were much easier to attach to mine staff.

CSO: 5500/5613-E

NEW BLACK TV STATION WILL BROADCAST ON 1 JANUARY 1982

Johannesburg SUNDAY TIMES in English 18 Oct 81 p 12

[Article by Kevin Davie]

[Text]

BRUSH up your Zulu and Xhosa, TV2 is almost here.

Technical, creative, production and administrative staff have been moving into their new home, old Broadcast House in Commissioner Street, Johannesburg, to prepare for black television's first broadcast on January 1.

The paint is still drying, the workmen putting the finishing touches to the interior and exterior of the building, cleaning staff are being hired, and technicians are trying to iron out last-minute problems.

It's all systems go, and those in the know say they will definitely be ready come the inaugural broadcast.

Broadcast House

Those responsible say that TV2 will attract a fair number of white viewers, especially to programmes like music and sport.

Mr Tim Ellis, the superintendent of TV2 and TV3, said the building was completely redesigned internally.

"The builders created a virtual shell, and then rebuilt the interior along modern studio lines."

There are three main studios and one smaller one. TV2 will also make use of several outside broadcast units and regional offices around the country.

"We have offices in Pretoria, Port Elizabeth and Durban, each with an outside broadcast unit," said Mr Ellis.

Moving in has been very hectic as there has been so much to do in a short space of time.

"We have encountered problems, but they're all solvable.

"One of the main difficulties lies in the provision of technical equipment, which is mostly custom-made, and so suppliers cannot supply that quickly," he said.

The equipment was the latest and best available, Mr Ellis said.

"A lot of our equipment is better than that they have at Auckland Park.

"Because of developments in micro-electronics, most of it is smaller and lighter and easier to handle."

He said a further problem had been the training of staff.

"But both those in front of and behind the cameras have learnt quickly, and are thoroughly professional."

Because of the enormous amount of planning involved, organisers have been working fulltime on TV2 for some years now.

"A core of organisers began making plans and programmes in 1975, but we only really got going in earnest in January, 1979.

"In some cases, particularly documentaries and drama programmes, we already have a stockpile which will last six months," he says.

All studio programmes will be made at Broadcast House, but actually broadcast from Auckland Park.

TV2 has also bought several programmes from overseas, and has a large dubbing department to change these programmes into black languages.

You can expect American cops to speak fluent Zulu!

"This dubbing operation is quite an art," said Mr Ellis, "the language has to be adapted to the peculiar movement of the lips, which isn't easy."

He said there was shortage of suitable black talent, and a host of personalities were about to establish themselves on the screen.

"In some cases we are using people who established themselves on radio, but in most cases we have discovered new faces who are very capable on the box."

TV2 is the first phase of a planned two-stage development for black television in South Africa.

In 1982, TV3 will begin broadcasting the Sotho group of languages.

CSO: 5500/5613-E

BRIEFS

FIRST FIBER OPTIC CABLE--A new lightning and electricity-proof telecommunications cable gets the official stamp of approval today after its installation in one of the Transvaal's lightning belts. The first "fibre optic" cable has been installed over a 7m stretch from Witpoortjie to Roodepoort. It will be formally accepted at a ceremony in Boksburg today by Mr H H Smit, the Minister of Posts and Telecommunications, from Standard Telephones & Cables South Africa. STC has researched the use of fibre cable based on its use in Germany. STC said the new system had other advantages over traditional copper cable in that it was unaffected by moisture seepage, and required little surveillance or maintenance. It is more expensive than conventional cable, but was needed in smaller preportions because it was much thinner. Fibre cable the thickness of a hair could replace cable as thick as an arm. The system could be used to replace any cable which was subjected to electrical interference and had a potential wherever copper was used to transmit signals. [Text] [Johannesburg RAND DAILY MAIL in English 19 Oct 81 p 13]

CSO: 5500/5613-E

RAINS CAUSE TRANSMISSION PROBLEMS

Dar es Salaam DAILY NEWS in English 23 Oct 81 p 1

[Text]

Tanzania's mass media institutions had difficulties in getting news messages from international news agencies for the past two days because of defects in the cable connecting the radio receiving station and the Extelecom main building in Dar es Salaam.

An Extelecoms spokesman was not in a position yesterday to say when the defect would be rectified but he explained that engineers were working round the clock to identify the fault on the 40-kilometre long cable.

He said news messages were, meanwhile, received at the radio station and retrasmitted through a local automatic transmitter to the press offices, including the *Daily News*. The transmission problems are suspected to have been caused by the recent rains, he said.

CSO: 5500/5617

KAUNDA COMMISSIONS CHIPATA-LUSAKA MICROWAVE LINK

Lusaka TIMES OF ZAMBIA in English 24 Oct 81 p 1

[Excerpt]

A GOVERNMENT that is ignorant of the aspirations and responses of the people is bound to fail no matter how committed it may be, President Kaunda said in Chipata yesterday.

Speaking at the official commissioning of the Chipata-Lusaka microwave link and radio transmitter of the Zambia Broadcasting Services, Dr Kaunda said mass communication was an essential tool of mobilisation of the people and harmonisation of all efforts for the common good.

He said it was through the communications media that the Party and its Government was able to explain the benefits of the programmes it had embarked upon and arouse the supportive response of the masses.

He reaffirmed his conviction that the mass media was one of the key pillars in the defence against external subversion and for the preservation of peace, unity and freedom in the nation.

"Our survival lies in improving the country's mass communication," the President said.

It was the policy of the Party and its Government to bring and improve radio and television reception to even very small centres of the country.

He urged Radio and Television Zambia to continually reflect Zambian values and aspirations and respond to developments as well as providing useful education and entertainment in their programmes.

In commissioning the Chipata microwave link and the associated exchanges, Dr Kaunda said if a rapid development of natural resources was to be achieved in Africa, the continent must "get hooked" to the rest of the world.

"The African continent cannot afford to remain isolated nor continue to lag behind technologically."

But, he said, although telecommunications were basic and necessary to modern life, there were many parts of Africa where they were still non-existent or insufficiently provided.

"To compound the problem further, where they exist, they tend to be between the African country and Europe and not between two African countries that share a common boundary.

"This is the situation which the Organisation of African Unity deplored in the early sixties. It still obtains, by and large. Today we are doing something positive to correct it."

He said the microwave link he was commissioning would go a long way externally, in providing direct access to countries of Eastern Africa and even further beyond, to the most parts of Africa and the world.

"Internally, it provides one more important infrastructure necessary for rural development."

He said two rural regional stations in Mongu and Solwezi which were being re-equipped had only radio facilities while Mansa, which would have radio facilities in a few months' time, would be developed to the standards of other centres.

The President said with the provision of microwave facilities to these regional stations television would be brought to the centres concerned as it was the policy of the Party and its Government to bring improved radio and television reception to every small centre.

He was impressed that the high transmission masts were designed, assembled and constructed by Zambians but warned there was no point in undertaking such an expensive venture if the objectives were not being reflected in the quality of programmes projected.

He thanked the Posts and Telecommunications Corporation workers for completing the microwave link on time in spite of handicaps which were inevitable to landlocked Zambia.

CSO: 5500/5616

ELECTRONICS LINK-UP WITH YUGOSLAVIA REPORTED

Salisbury BUSINESS HERALD in English 5 Nov 81 p 1

[Text] Co-operation between a Yugoslavian firm and WRS (Pvt) Ltd has resulted in the manufacture of new telephones and PABX systems in Zimbabwe.

Mr Paul Taylor, joint managing director of WRS, said that because the equipment will have a high local content and will be locally assembled, there should be substantial foreign exchange savings.

"There will also be strong export potential to neighbouring countries," said Mr Taylor.

He said Zimbabwe's telecommunications network needed to be extended and the large Yugoslavian electronics firm, ISKRA, wanted to be involved in this development.

This gave WRS the opportunity to diversify but remain in the high technology field.

ISKRA produce a variety of telephone sets and fully electronic PABX systems. It will supply WRS with component parts, the initial technical back-up and technical training.

Mr Taylor said the PABXs will range from 16 to more than 100 lines, and are small smaller, silent and more reliable than the electro-mechanical type.

When the first products are on the market in early 1982, WRS will have fully trained maintenance teams and user training facilities.

Asked about the effect of import allocation cuts, Mr Taylor said production would be reduced in proportion to the cuts and efficiency will not be as high as desired.

As part of the diversification drive, the company is manufacturing mine detectors for which a large export order is nearly complete, cash registers and field telephones. A cordless telephone is awaiting PTC approval before being locally produced.

CSO: 5500/5618

FILLIOUD, MEXANDEAU INTERVIEWED ON FUTURE OF TELEMATICS

Paris ZERO UN INFORMATIQUE in French Sep 81 pp 69-72

> [Text] What place will telematics occupy in the great arena of social and economic communication? What are the government's priorities in this area? Finally, what changes are the new telematic resources going to bring into our everyday lives, both at work and at home?
>
> Georges Fillioud, Minister of Communication, and Louis Mexandeau, Minister of Posts and Telecommunications (PTT), answer questions on these subjects in an exclusive interview tih "01 Mensuel."

01: Mr Minister, if we might glance to the future, the first question which comes to mind is this: Excatly what roles can data processing and telematics play in communication and how can the consequences be measured?

Georges Fillioud: Data processing developed above all as a management tool of the great organizations (agencies, businesses) or as a tool for forecasting or planning. The appearance of microprocessors made possible a change in scale. From now on, people will be talking about domestic data processing. The linking of the latter with television and the telephone gave birth to telematics, which from now on can bring data processing within reach of all pocketbooks and meet all needs.

Simplified use of the instrument and linking it with widespread technical means (the telephone, television) are going to introduce telematics into everyday life.

We therefore have the makings of a true revolution in communications. The satisfaction of administrative requirements, the ability to perform commercial transactions (ticket reservations), and just the immediate availability of practical information of every kind (weather, transportation, etc.) would provide more time, cut down on travel, simplify life....

Telematics can also play a special role in decentralization, if a volunteeristic policy is mobilized in that direction. And such a policy is absolutely necessary, since telematics are only a tool which reflects the "social project" directing its use.

OI: Right or wrong, a contrast is often made between telematics and individual data processing. In your opinion, can the latter be an obstacle to social communication?

GF: The significance of the word "individual" should not be exaggerated: The interaction of systems allows for a certain form of dialogue; systems can also favor interpersonal or group communications: Such is the case of the teleconference, computer assisted, which is being developed in the United States and which could, undoubtedly, fill in France a very useful role in experimentation and social research. To avoid the dangers of using data processing in the way you seem to fear, experiments should be encouraged which enhance the uses by groups or associations.

OI: Telematics, for its part, unleashes a certain number of fears about the abuses of power it may lead to. How do you reconcile, in a democratic society, State control of telematic capabilities and freedom of information?

GF: In a democratic society the State is only one of several users of telematics. As for the problems of entries on card indexes, their use, etc., there exists a national data processing and freedoms Commission, independent of the executive branch, which is capable of guarding the respect and protection of individual rights and freedoms. As for freedom of information, the great documents about the press (the law of 1881--the ordinance of 1944) and, in the audiovisual area, the ongoing reform which should lead to the real independence of these media in relation to governmental power, seem to me to be adequate guarantees.

OI: If independence is guaranteed, another form of discrimination can come from the taxes imposed or the competence required. By what means can equality of access to information be assured, when such access is possible only through expensive and complex technological means?

GF: That is a real problem but the relative price of this equipment will come down as a result of mass production. Moreover, these means should be accessible to all in open consultation locations. And, telematics will be only one of several information aids: The printed press and television will continue to play their role, which is predominantly for immediate, live information. I am convinced that a page of data seen on a screen will never replace a page of a newspaper.

OI: In a more specific area, that of the press, many fears are also becoming apparent. Isn't there a risk that the information used by telematics will be regulated by rules foreign to traditional press ethics?

GF: On the subject of telematics there is currently a legal vacuum. The code of the PTT ("private correspondence") no longer appears to be adapted to the evolution of technology and methods. It will definitely be necessary to change this situation by introducing rules which could merge with those of the written press (right to reply, responsibility, etc.).

That's one of the questions which will have to be examined by the national press-telematics commission which will be formed in the near future, at the request of the President of the Republic, specifically to prepare a debate in the Parliament on that subject.

O1: Mr Minister, developments in telematics are today becoming more and more numerous and diversified. What are your major priorities in this area and what are the budget lines which correspond to them?

Louis Mexandeau: As for telematics, by the networks that it is completing and offerig to the public, by the numerous appeals to service companies in anticipation of the perfection of multiple access logic systems, by the standardization of procedures, by the definition and purchase of terminal equipment, the PTT Administration occupies a predominant position in the market. This sector's commitment to development is materializing in this area through annual investment expenditures on the order of 2.5 billion francs, not counting th eportion related to the Telecom 1 satellite.

The industrial program will be sustained, but we will see, on the one hand, development which is united (voluntary) rather than imposed and, on the other hand, more specific development of collective telematics or professional telematics.

O1: At the administrative level and still in the area of telematics, do you foresee a redefinition of areas and missions among the departments and organizations attached to your Ministry and those connected to other interested parties?

LM: In the current situation, concerning the technical branches of the PTT Administration (CNET) [National Center for Telecommunication Studies] or of the PTT Ministry (CCETT), [Common Center for Television and Telecommunications Studies], no redefinition of areas is planned with the branches of other ministries; current cooperative arrangements will continue and be developed.

O1: As a result of the very expansion which telematics is now undergong, the problem of the standards controlling data transmission is becoming particularly acute. What is your view of the role of the departments in your Ministry in such a complex area, which is clearly multifaceted?

LM: In the area of data transmission, as in the whole realm of telecommunications, we are actively pursuing a policy of standardization and particularly international standardization. The objective is to avoid fragmenting the market into incompatible systems leading to the creation of captive markets for the profit of large multinational groups.

The purpose of standardization is to protect the interests of the user, who must be assured of being able to communicate with all the users of the same kind of service, and who must be able to have available the greatest range of equipment at the best prices.

Standardization also promotes the interests of French industry, which must be able to play its role fully in both the national and world markets.

Naturally, in the context of this policy, France actively participates in the work of competent international organizations: CEPT [European Conference on Posts and Telegraphs], CCITT [International Consulting Committee on Telephone and Telegraph], CCIR [Radio telegraphic Interregional Consulting Committee], ISO [International Standard Organization].

We should also realize that since data transmission is a rapidly evolving area, as a result of technological progress, the policy of standardization must be developed so that it does not stifle creativity and allows for adapting to new situations.

01: More precisely, can you define the directions pursued in the three areas of videotex, local networks and external networks?

LM: One approach should be pointed out first of all: In the field of videography, we insisted on having identical standards (for layer No. 6 "presentation") for the interactive Videotex (on the telephone network) and the broadcast teletext (on the television network). That was possible chiefly thanks to the existence of the common laboratory of TDF and CNET; that is, the CCETT.

As for Videotex and Prestel, there is reason to emphasize that the problem is now rectified at the European level: Last May at Innsbruck, CEPT's adoption of a unique European standard put an end to the divergences which had arisen in the past between the Frenchand English systems, especially. In the same spirit, we are studying, with our European partners, the possibilities of reconciling this European standard and the standard recently published by ATT for the North American continent.

You also brought up the local networks. Our thinking should focus not only on a particular type of loop network but on the general problem of the business network. At a time when the concept of RNIS (integrated service digital network) is being studied for public networks and when we see fiber optics entering the picture, the standardization effort must take into account, for the business communication system, not only data but also the spoken work and pictures.

For our part, we should go beyond parochial quarrels (configuration as a star, in a loop, or bus-shaped; a network with subscribers selected competitively or a pay-as-you-go system) and address two fundamental objectives for the local network: on one hand, easy interface of the local network with the public one and, on the other, easy interafce with the local network by the terminals, planned for the public network (telematic terminals).

The present status of standardization of the public network provides, for that purpose, a solid foundation (particularly, decision of the CCITT like X25 or X21 and S62, S70, etc.).

As for external networks, the problem there, too, is not to take a position vis-a-vis a particular contractor's set of procedures like IBM's SNA system (which can be compared with the DSA system of C11-HB). What is important is to promote an architecture and procedures accepted worldwide and allowing for the widest interconnection of data processing systems and terminals.

I would say that, in this extremely complex field, the results obtained are encouraging. As you know, the basis is the architecture model in layers of the ISO. In evaluating the first three layers of this model, we can consider that the decisions of the CCITT like X25 and X21 provided a satisfactory response. For level 4 (transportation), extensive discussions have taken place with contributions especially from ECMA [European Association of Computer Manfuacturers] and have led to CCITT decisions like X70. Work is progressing within Commission VII of the CCITT. For higher levels, it seems to us that decision X62 developed for teletex can serve as a foundation for further work.

OI: The international dimensions of telematics raise the question of more and more telecommunications equipment arriving on the French market. What is your policy in regard to approval of these products?

LM: The General Directorate of Telecommunications must assure the overall quality of the network. The whole procedure for equipment approval is one of the measures to achieve this general objective. More specifically, approval of private terminal sets makes it possible to avoid later on any disturbances of the network because of incompatible equipment, but also to protect the user against the malfunctioning of his own set.

The judicial basis is in the PTT Code, articles L32 and L33, which define "Telecommunications" and their monopoly. Articles D440 and D441 to D445 provide the regulations covering private sector supply of terminals and the requirement for their approval.

The approval procedure is regulated by an administrative text, the general instruction on Telecommunications service (section TC1, which is being revised). From the technical point of view, approval is based on specifications suited to France but which are derived, in the great majority of cases, from international texts (particularly, the decisions of the CCITT).

In France, unlike most other countries, the approval procedure applies indiscriminately to all equipment no matter what its origin or manufacturer. The only "restriction" for foreign equipment is that it be presented for approval by a French legal firm. No equipment is refused approval because of its origin.

As for modems, the French position is one of the most open. Whereas all modems in Italy are furnished by the PTT, and a clear majority of them is furnished by the agencies in Federal Germany and Great Britain, in France the major part of all equipment is of private origin. For the proper functioning of the network, modems integrated with terminals (this case is becoming common) must continue to be seen at the time of approval.

OI: There is another area in which foreign participation can mean a cultural and economic dependence: Data banks of foreign origin. What is your position on this subject?

LM: In the area of data banks the role of the PTT is limited, as a general rule, to the transfer of information. The promotion of these banks in France is not its responsibility but that of other ministerial departments as well as the suppliers themselves. The same is true with regard to the problems of economic and cultural dependence which the use of foriegn data banks may eventually raise.

To meet the developing needs of users with respect to distant access to sources of information, the French administration of the PTT has been striving, since 1978, to establish international public data services by bulk switching.

This action led in particular to: Establishment of the Euronet network, in cooperation with the Commission of European Communities. This network has been operating since 1979 and gives access to more than 150 data bases or banks located in the member countries.

In 1980, a public bulk switching service was also opened with the United States. Access to this service, as to Euronet, is assured via Transpac and an international transit node (NTI) used by management.

In the context of competition among suppliers, the Transpac network permits the development of a national information market. Through the various possibilities which it offers for connection with foreign networks, it also permits French suppliers to expand their market to the international clientele.

Finally, PTT's free installation of Videotex terminals for voluntary subscribers to use the telephone director service will lead to the creation of a very important potential market for French data banks, the number of clients quickly mounting into the millions. General public data banks should then be developed rapidly.

O1: Mr Minister, do you think that the Telecom 1 program can effectively compete with SBS-type services, which are now American, but which should soon become intercontinental?

LM: The French communication satellite program Telecom 1 will be operational about 3 years later than the SBS program, a satellite system put into operation by three North American companies (Aetna Life and Casualty, Comsat, and IBM) to offer digital links to the large corporations on United States territory. SBS has been operating since the beginning of 1981 but it should be pointed out that the SBS company has not, in spite of is efforts, obtained the status of international "carrier" from the Federal Communications Commission. In addition, the coverage of SBS satellites is limited to the North American continent.

Telecom 1, in its role of supplier of digital links to businesses (which is only one of its missions whereas SBS is entirely devoted to it) is based on a technical design equal to that of SBS and certainly more advanced than that of the American Satellite Corporation, another North American program which has had significant commercial success.

The two areas in which Telecom 1 is undeniably ahead are in signaling, on the one hand, and land sub-networks, on the other. The signaling, in conformance with European and international standards presently in effect or being defined, is of an advanced type and is going to make Telecom 1 the first digital network with integration of services in the world.

The land sub-networks, which appeared necessary from the beginning of the program, for draining toward the divided antennas the communications of businesses located near them, were also defined in conformance with the transmission and switching standards of the European Conference of posts and telecommunications, and are thus adapted to the European mission of such systems. it should be noted in this connection that SBS had to introduce rather late this concept of divided antennas and finance local switching and transmission equipment which will be delivered to it at the end of 1982 and which should, in the end, handle more than 60 percent of its traffic.

The equipment and terminals developed for Telecom 1 (videoconference rooms, fast telecopiers, data processing...) are also defined in accordance with the European agencies, especially in the context of the European videoconference project EVE or of the data processing pilot project Nadir.

Whereas the SBS system was established with the goal of "skimming off" business traffic at the expense of the traditionally using companies, the concept of Telecom 1 is, on the contrary, based on integration into existing networks with a goal of complementing the services offered. This concept is better adapted to the situation which exists in Europe, as is borne out by the interest shown in the program by the agencies of our partners. Germany has indeed decided to use Telecom 1 for its national needs and, with the Eutelsat organization serving as an intermediary, Telecom 1 will also enable international services to be offered in Europe.

The expansion of service to intercontinental traffic should be achieved by linking the SBS system with Telecom 1 through the Intelsat network or fiber-optic ocean cables in an initial phase. After that, it's possible to foresee an interconnection by satellite linkage.

01: What is your policy in the area of the commercial services which are offered by the PTT and which may become competitive with those proposed by private industry?

LM: As for the commercial services offered by the PTT and which are not monopolistic, the PTT must be present on the market either themselves or through their affiliates. This presence, if it must be affirmed more than it has been previously, will take into account the sometimes difficult situation of private sector businesses, and studies are underway to insure that the competitive balance is not upset by the power of the PTT at the expense of all the businesses activein the sector.

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NEW TESTING PROCEDURE FOR ELECTRONIC SPC SWITCHING SYSTEM

Rome NOTE, RECENSIONI, NOTIZIE in Italian Apr-Jun 81 pp 66-77

[Article by G. Bertieri, ITALTEL, Milan, R. Scarinci, Higher Post Office and Telegraph Institute: "New Methods for Certifying Electronic Automatic Switches with Recorded Programs"]

[Text] Summary. This work reports on an experiment which is still in progress at the switching and signalling laboratory of this institute is to propose a new procedure for the certification of new SPC automatic electronic switches. Essential characteristics are remote checking post-processing, with suitable program, of data recorded from the center.

1. General Remarks

The main functions which a telegraph switching exchange must perform are as follows:

(a) Establishment and separation of connection;

(b) Exchange of messages;

(c) Special services:

Documented or undocumented rate determination, depending on the particular case,

Determination of user categories,

Dispatch of written signals.

Making an entirely electronic automatic switch, capable of performing the above-indicated fundamental functions, offers the following advantages, compared to the traditional electromechanical automatic switches:

Smaller size (ratio of 1:5) and less weight of apparatus;

Less energy consumption;

Longer duration of equipment compared to lifetime of electronic components;

Reduction of expenditures;

Faster operating speed;

Possibility of offering the user special services.

2. EDS Switching System

The EDS (Electronic Data Transmission System) System is an electronic switching system for telex and data of the recorded-program type.

The switching system is asynchronous and transmission is accomplished by analog carrier waves (FDM channels); it is capable of connecting as many as 28,000 user lines and can process more than 50 calls per second.

An EDS center can be visualized as being subdivided into two parts:

A centralized part which processes programs mostly oriented toward switching;

A part for the connection and adaptation of lines.

Main Units (Figure 1)

PE--program control unit which follows the instructions provided for in the program;

GE--apparatus control unit which runs the traditional peripheral units, that is to say, the tape and disc memories;

TE--Generating unit for timing which generates the basic operating rhythms;

SE--memory unit with the following functions:

Exchange between the various units,

Support of programs and data,

Image of location of lines and communications in progress;

LE--line control unit which makes it possible to interconnect among each other, with perfect trunk group, the lines that are switched from the center.

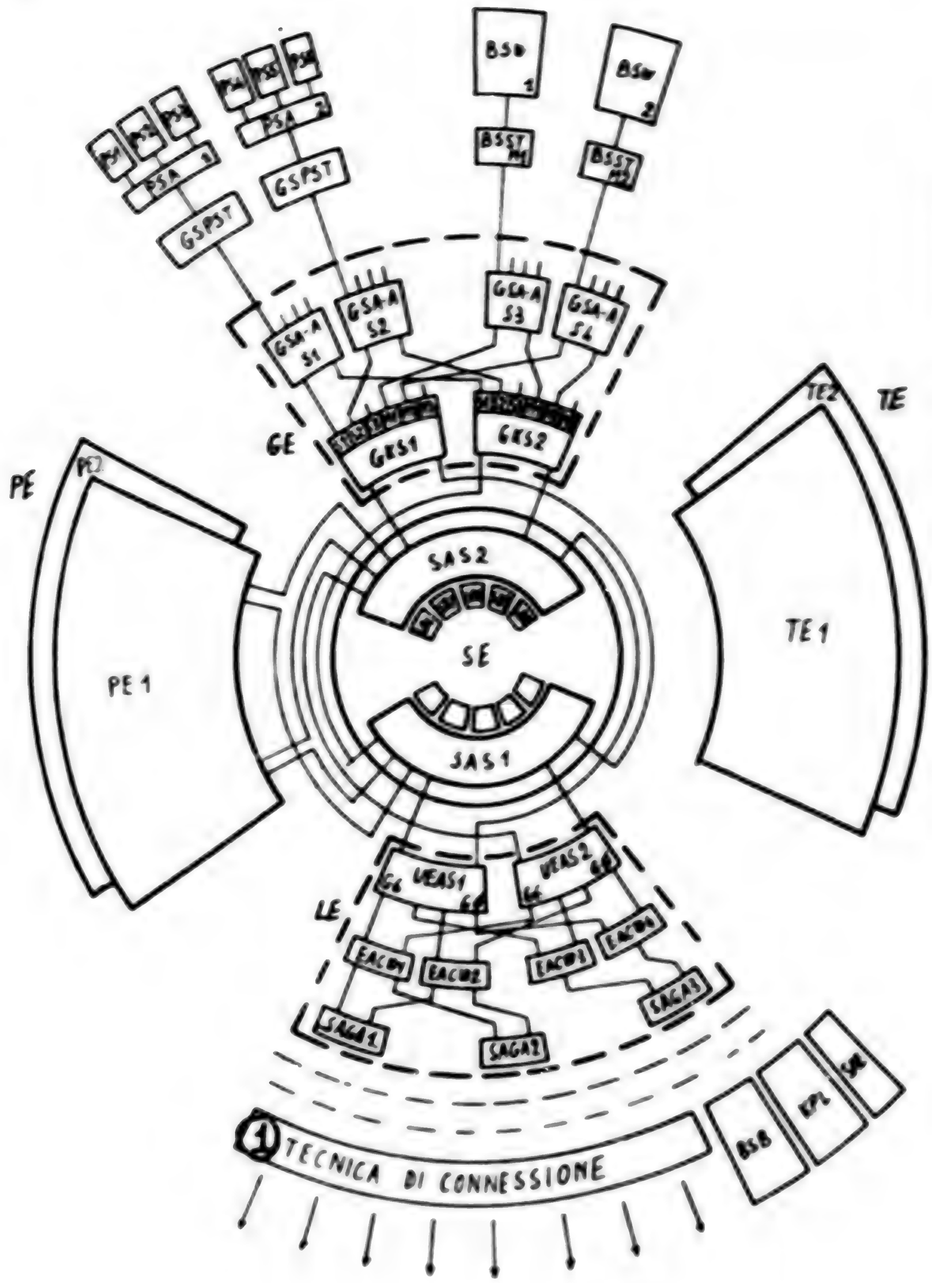


Figure 1. Automatic switching EDS block diagram. Key: 1--Connection equipment.

These units interact among each other on the basis of the multiprocessing method.

The various units are not directly connected but can exchange information among each other through SE memory units.

Each unit is duplicated in modular redundancy (Figure 2b) for the purpose of increasing the reliability of the entire system with respect to parallel redundancy (Figure 2a) where a breakdown on two parallel lines would place the entire system out of action.

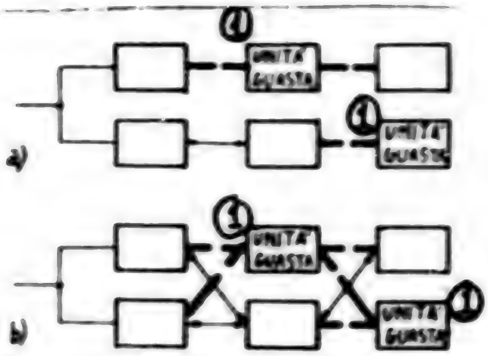


Figure 2. Redundancy. (a) Parallel; (b) Modular; 1—Unit that broke down.

The operating principle here is the principle of multiplex with asynchronous time division; it consists in transmitting only the polarity inversions among interconnected lines (3).

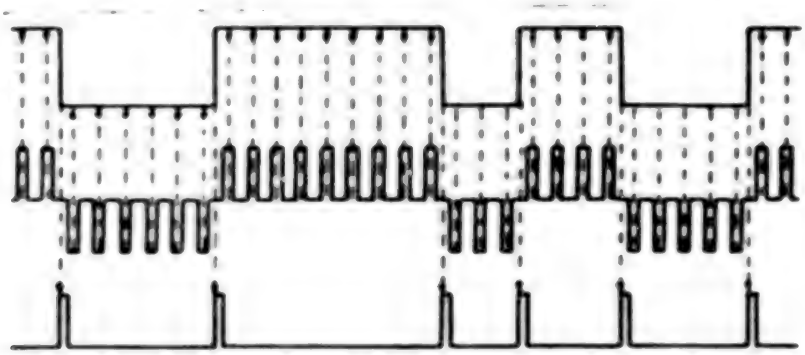


Figure 3. Sampling of signal. "1"--binary signal; "0"--multiplex with synchronous time division; EDS multiplex with asynchronous time division and translation of polarity inversions.

We note as a matter of fact that, statistically speaking, two successive signal elements, in 50 percent of the cases, present the same polarity; it follows from this that the number of polarity inversions to be transmitted will be half the total number of elements in the signal. In the end, the multiplex involvement turns out to be less.

The software of the EDS system consists of two fundamental parts:

Software of the operational system which contains the switching programs;

Software of the testing and maintenance system.

The switching program calls for preserving a memory zone for each connection and for its entire duration. In these zones, the data which characterize the connection are memorized.

After that, the system uses a routing subprogram which, by analyzing the selection digits, determines the destination of the call and the rate schedule step for billing purposes.

Another subprogram provides for the selection of outgoing junctions.

The connection between an incoming line and an outgoing line can be considered to be exclusively of the software type: transfer of numerical information from incoming line to memory and from memory to outgoing line. This virtual connection lasts 800 ns for every information transmitted. From what we have said so far—although only in a succinct manner for reasons of brevity--it is obvious that it is necessary to place procedures for testing these numerical automatic switches on new bases and on new concepts. As for the rest, since the physiognomy of the operator at the exchange has been changing and is moving closer to that of an operator at a data processing center, there is even more reason to change the physiognomy of the tester [certification expert].

It is evident that the issue of the approval certificate in this case involves a major effort and a knowledge, not only of the problems of traditional telegraphy, but also of a standard data processing center.

We must therefore keep in mind that, especially in certifying the first plants, an additional difficulty might arise in the "dialogue" between automatic switches which turn out to be dishomogeneous not only in terms of the equipment (electronics --electromechanical) but also because of age (for example, state members).

Determining that a numerical automatic switch operates properly therefore presents major difficulties both in relation to its structure (large-dimension data processing center) and in relation to the tasks to be accomplished. It follows from this that certification [approval] by the ISPT [Higher Post Office and Telegraph Institute] can only be assigned to a group of technicians who are differentiated by virtue of their knowledge in the field of data processing systems and in the field of telegraphic switching and signalling.

Among these technicians we must therefore find an individual who--apart from the hardware of the system and assuming that it works because the others have already checked it out--will focus his attention on the tasks of switching and dialogue between exchanges.

In other words, this new person of the "switching operator" will have to be able to consider electronic automatic switching as a closed box into which enter and from which leave a certain number of wires (the lines), checking their operational performance and concentrating on switching.

3. Evaluation Parameters in Certifying a Numerical Automatic Switch

A common feature among SPC (storage program control)automatic switches is the feature of memorization of a certain quantity of data pertaining to the connections, some in a temporary fashion and others in a permanent manner.

3.1. Data Phrases in EDS System

The EDS System memorizes various types of information in the form of "phrases" put into the central memory.

There are three types of phrases and they are distinguished by the content of the first four bits which provide the identification key for them.

(A) Phrases Referring to Switching

(B) System Phrases

(C) Phrases Caused by Immissions and Emissions in the Operator Console

(A) Phrases Referring to Switching

These are phrases which describe a connection and which are broken down in to CRJ (Connect Record Journal) phrases or phrases describing the phases of building up a connection, and DRJ (Disconnect Record Journal) phrases or phrases which describe the conclusion of a connection.

A connection which has ended properly is described by a pair of phrases CRJ/DRJ, while a connection, for which the caller was unable to reach the data transmission phase, is described only by the phrase CRJ.

(a1) CRJ Phrase (Figure 4)

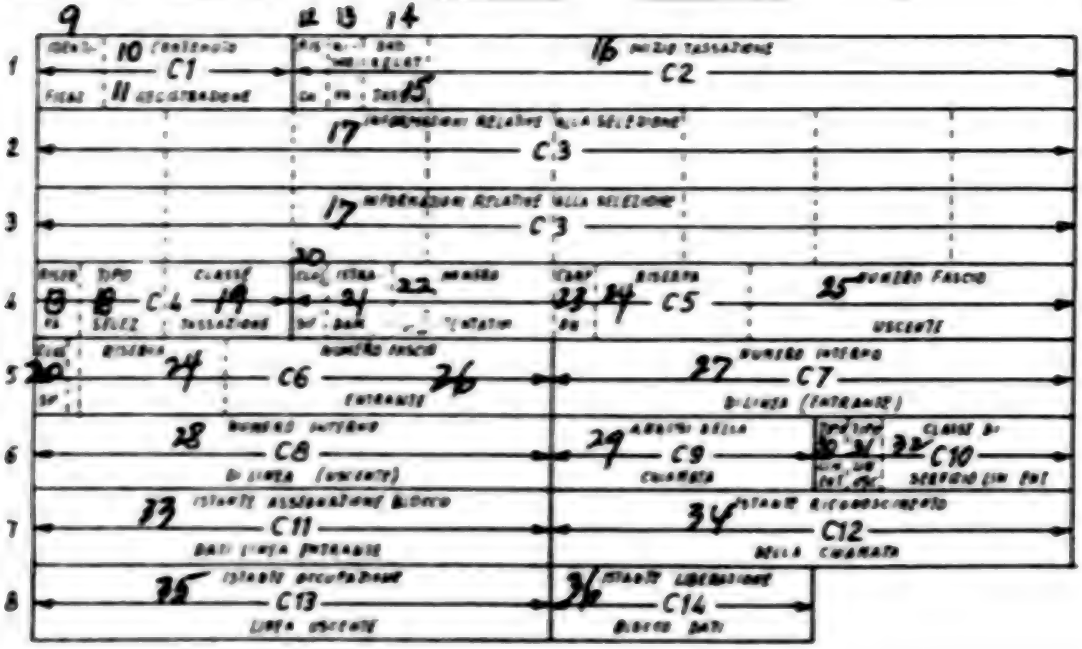


Figure 4. CRJ Phrase. Key: 9--Identification; 10--Content; 11--Registration [recording, storage]; 12--Search; 13--Reserve; 14--Pertinent data; 15--Rate determination; 16--Start of rate or charge determination; 17--Data pertaining to selection; 18--Type of selection; 19--Rate schedule class; 20--Classification; 21--Routing; 22--Number of attempts; 23--sampling; 24--Reserve; 25--Number of outgoing line groups; 26--Number of incoming line groups; 27--In-house number of (incoming) lines; 28--In-house number of (outgoing) lines; 29--Call analysis; 30--Type of incoming line; 31--Type of outgoing line; 32--Class of service, incoming line; 33--Instant of incoming line data block assignment; 34--Instant of call recognition; 35--Instant of outgoing line occupation; 36--Instant of data block release.

The phrase CRJ, used during the buildup of a connection, lasts 31 bytes which can be memorized completely or only in part, depending upon whether or not the statistics have been provided for the center.

The recorded data can furnish a "story" describing the buildup of the connection if it worked properly or, otherwise, the story of the entire connection.

(*)--Information items memorized only when statistics are provided for the Center.

Among the various information items we as a matter of fact have the following:

The in-house number of the line (ILN) on which the call is recognized, the type* of lines, possibly the number and the type of line group to which it belongs and the instant* at which the call is recognized and its possible chargeability in terms of rates.

The instant* at which a data block is associated with the line coincides practically with the instant at which the invitation to dial is transmitted.

The dialing digits and the type of dialing.

Outcome of routing, number of attempts made to build up the connection.

Outgoing ILN, its type, possibly number and type of line group to which it belongs.

Instant* of outgoing line occupation.

If the connection worked well, the instant at which the charge time starts--whereas, if the connection was not put together, the instant* of line release and, in this case, the cause* that led to the release prior to the completion of the connection build-up.

(a2) Phrase DRJ (Figure 5)

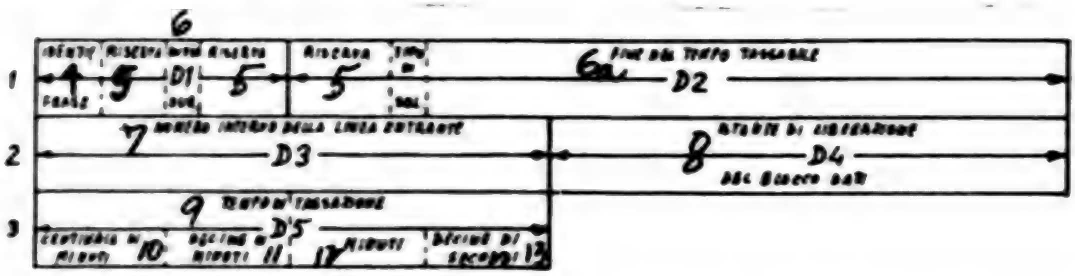


Figure 5. Phrase DRJ. Key: 1--Phrase identification; 5--Reservation; 6--Sending duration; 6a--End of chargeable time; 7--In-house number of incoming lines; 8--Instant of data block release; 9--Charging time; 10--Hundreds of minutes; 11--Tens of minutes; 12--Minutes; 13--Tens of seconds.

The phrase DRJ, used by the switching program during the phase of releasing a connection which has been made has a duration of 10 bytes during which information items on the call are memorized:

The calling ILN, used as the key for interconnection among connection build-up phrases and release phrases.

Chargeability or nonchargeability of call and, if yes, duration transmitted to caller;

Instant of end of chargeable time;

Instant of release of data blocks associated with calling line.

(b) System Phrases (Figure 6)

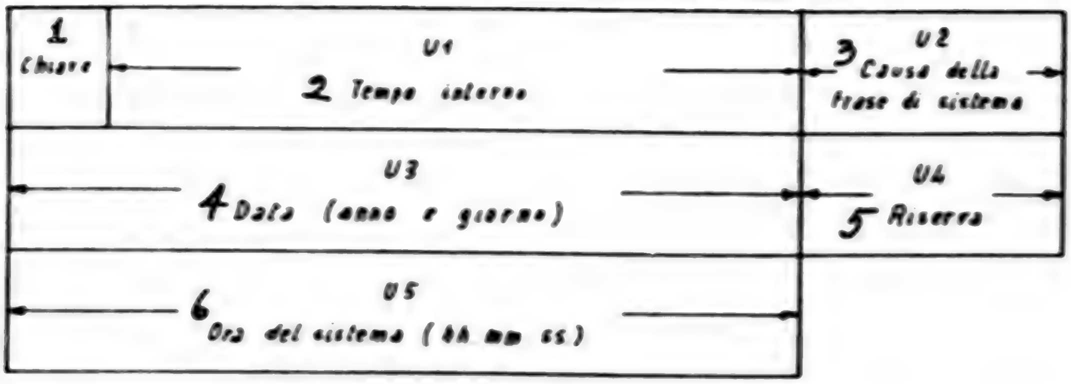


Figure 6. System phrases. Key: 1--Key [button]; 2—In-house time; 3--Cause of system phrase; 4--Date (year and day); 5--Reservation; 6--System time (hours, minutes, seconds).

These are phrases which are memorized by the system in special situations, that is, when there has been a particular event which influences the various other registrations [recordings] and which must therefore be taken into consideration.

Such special events are as follows: restart, newstart, and date [data] change.

They influence the data memorized either due to the effect which they have upon switching (RE/NEW) of due to the resetting of the daily [journal] clock which is used in determining all memorized times (date change).

We must as a matter of fact keep in mind that restart completes the connections during the build-up phase and during the release phase and that newstart also interrupts the connections which are in progress; the consequence of this will be that not even the CRJ relative to the connections in the build-up phase will be memorized and that, regarding connections in the release phase, no DRJ will be memorized and hence the system phrase will have to be used as DRJ.

The phrases in question have a fixed duration of 11 bytes and--in addition to the key that identifies them as such and their motivation--they contain information on the instant at which materialized the cause that motivated them, the date, and the hour [time] of the system.

(c) Phrases Caused by Immissions and Emissions in the Operator Console (Figures 7-8)

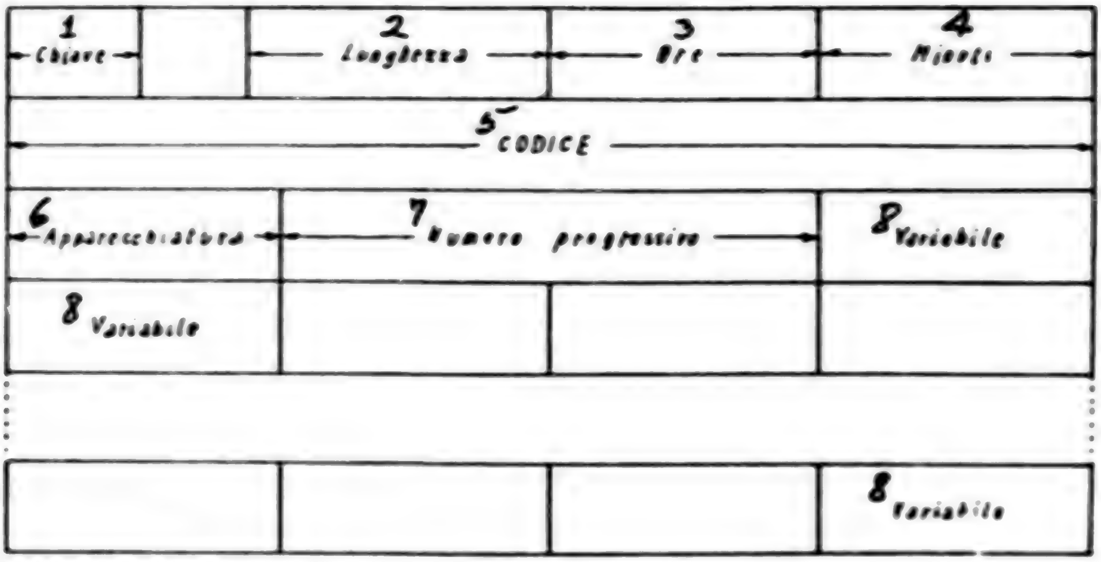


Figure 7. Immission Phrases. Key: 1--Key [button]; 2--Duration; 3--Hours; 4--Minutes; 5--Code; 6--Equipment; 7--Progressive [sequential] number; 8--Variable.

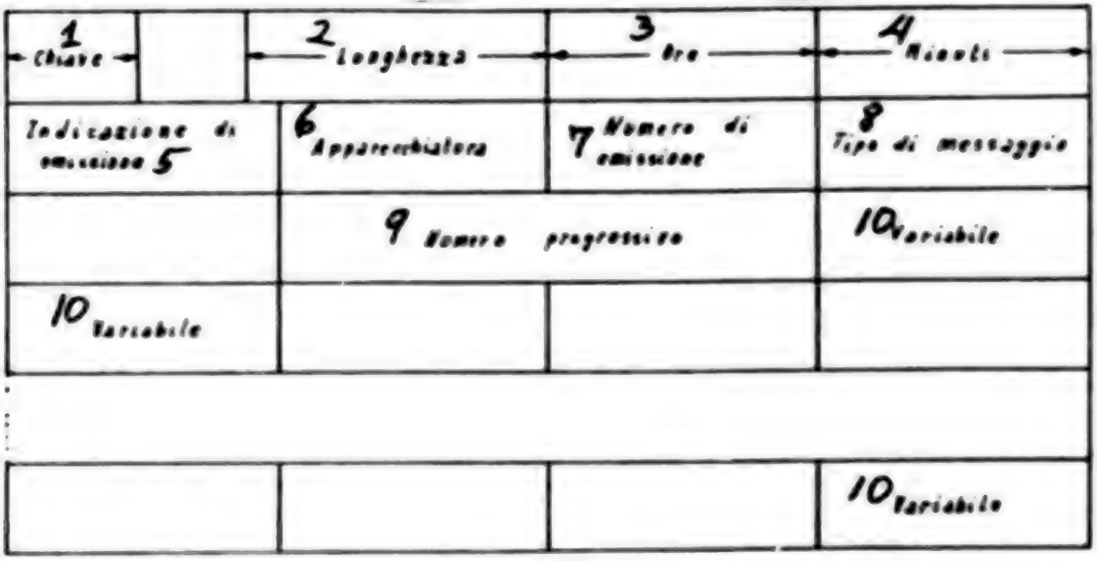


Figure 8. Emission Phrases. Key: 1--Button; 2--Duration; 3--Hours; 4--Minutes; 5--Indication of Emission; 6--Equipment; 7--Number of emission; 8--Type of message; 9--Sequential number; 10--Variable.

These phrases are generated when, at the operator console, there takes place any operation involving the reading or variation of data fields through an operator "code" that establishes the type of operation and the field (or fields) to be handled.

This type of phrases has a variable duration since, in addition to the fixed information items, such as immission (emission) apparatus, the time at which the operation was started, the sequential message number, it also contains the code given and the variables which will guide the program that will have to run the input/output operation. Therefore, in addition to all of the information items provided, the duration of this phrase is also memorized at the start of this phrase.

3.2. Disc Unit for Memorizing Phrases Given

The EDS system uses four disc units to guarantee the availability of support for the registration [recording, storage] of phrases given; these units are subdivided into two groups:

Pair of CRJ units for normal handling of registration;

Pair of service units for handling in case of necessity, when the two CRJ units are momentarily not usable for registration.

3.2.1. Structure of Data Support (Figure 9)

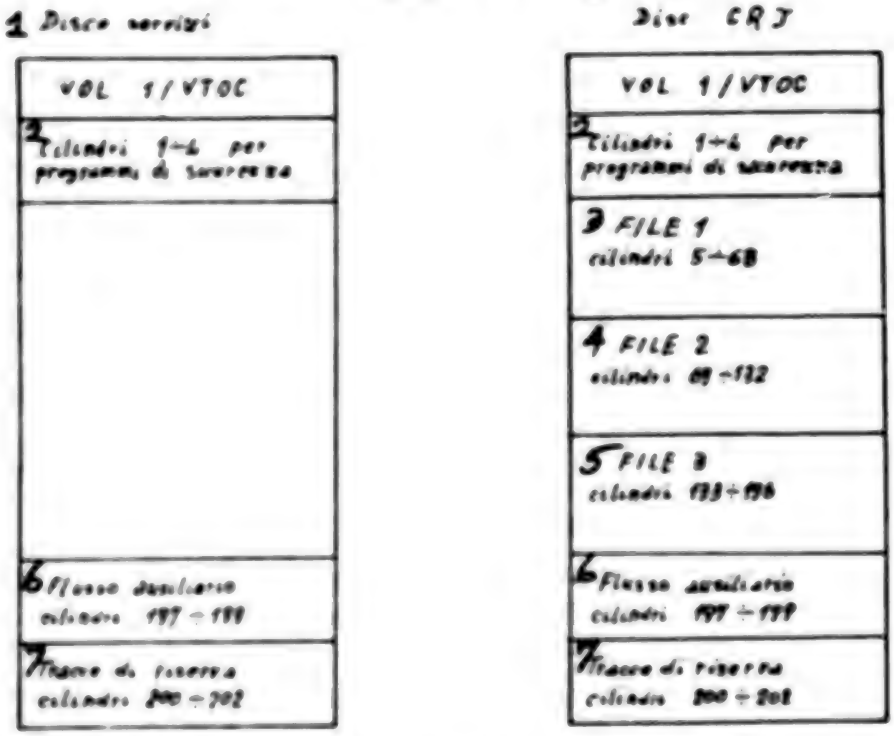

1 Disco servizi
Disc CRJ
VOL 1/VTOC
VOL 1/VTOC
2 Cilindri 1÷4 per programmi di sicurezza
2 Cilindri 1÷4 per programmi di sicurezza
3 FILE 1 cilindri 5÷68
4 FILE 2 cilindri 69÷132
5 FILE 3 cilindri 133÷196
6 Flusso ausiliario cilindri 197÷199
6 Flusso ausiliario cilindri 197÷199
7 Tracce di riserva cilindri 200÷202
7 Tracce di riserva cilindri 200÷202

Figure 9. Structure of CRJ disc and auxiliary rows and of service disc.
Key: 1--Service disc; 2--Cylinders 1-4 for safety [backup] programs; 3--Row 1, cylinders 5-68; 4--Row 2, cylinders 69-132; 5--Row 3, cylinders 133-196; 6--Auxiliary flow, cylinders 197-199; 7--Reserve tracks, cylinders 200-202.

The CRJ discs used are set up in the following manner:

Four cylinders available to the system;

Three rows of 64 cylinders for memorizing data in a normal situation;

One auxiliary row with three cylinders for memorizing data after emergency conditions have arisen. This latter flow--with the same dimensions and the same position on the disc--is again generated also in the pair of service discs.

3.2.2. Structure of Rows (Figure 10)

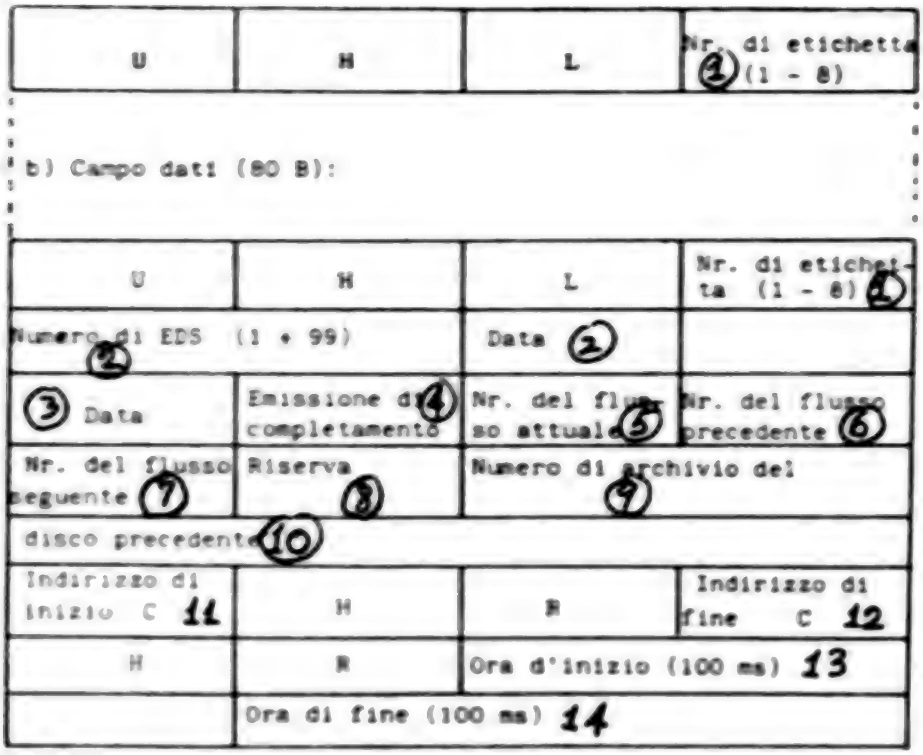
VOL1	Standard volume label [ticket]
HDR1	No 1 flow start standard label
HDR2	No 2 flow start standard label
UHL1	
.	
.	User lables, 1-8
.	
UHL8	
TM	Separation marker
Call data block	
Call data block	
.	Call data (duration of block =3,520 bytes)
.	
.	
Call data block	
TM	Separation marker
EOF1	Flow-end standard label
EOF2	No 2 flow-end standard label
UTL1	User-end label
TM	Double separation marker
TM	

Figure 10. Structural organization of a row.

Every row on a disc has an initial area in which are memorized labels [tickets] for the volume, the start of flow, and the user, followed by data blocks.

Particularly interesting are the UHL user labels which, among the various information items, contain the following (Figure 11):

Number of UHL,
Number of center,
Date,
Direction of start and direction of end of flow,
Number of current flow, number of successive flow,
Instant of closing of labels [tickets],
Information on period of reg [illegible] ion time relating to this memorization.



U	H	L	Nr. di etichetta ① (1 - 8)

b) Campo dati (80 B):

U	H	L	Nr. di etichetta (1 - 8) ①
Numero di EDS (1 ÷ 99) ②		Data ②	
③ Data	Emissione di completamento ④	Nr. del flusso attuale ⑤	Nr. del flusso precedente ⑥
Nr. del flusso seguente ⑦	Riserva ⑧	Numero di archivio del ⑨	
disco precedente ⑩			
Indirizzo di inizio C 11	H	R	Indirizzo di fine C 12
H	R	Ora d'inizio (100 ms) 13	
	Ora di fine (100 ms) 14		

Figure 11. Structure of UHL utilization labels [tickets]. Key: 1--Number of label [ticket]; 2--Number of EDS; 3--Date; 4--Completion emission; 5--Number of current flow; 6--Number of preceding flow; 7--Number of next [following] flow; 8--Reservation; 9--File number of; 10--Preceding disc; 11--Direction of start C; 12--Direction of end C [call]; 13--Start: .g time (100 ms); 14--Termination time (100 ms); (b) Data field (80 B).

The UHL refers to the maximum registration of one day and to it refer all of the data blocks which follow the area of labels [tickets] and which are comprised between the initial direction and the final direction memorized in the UHL itself.

We want to recall here also briefly the organization of these data blocks, consisting of a head containing the date and time of memorization and the quantity of significant data (Figure 12).

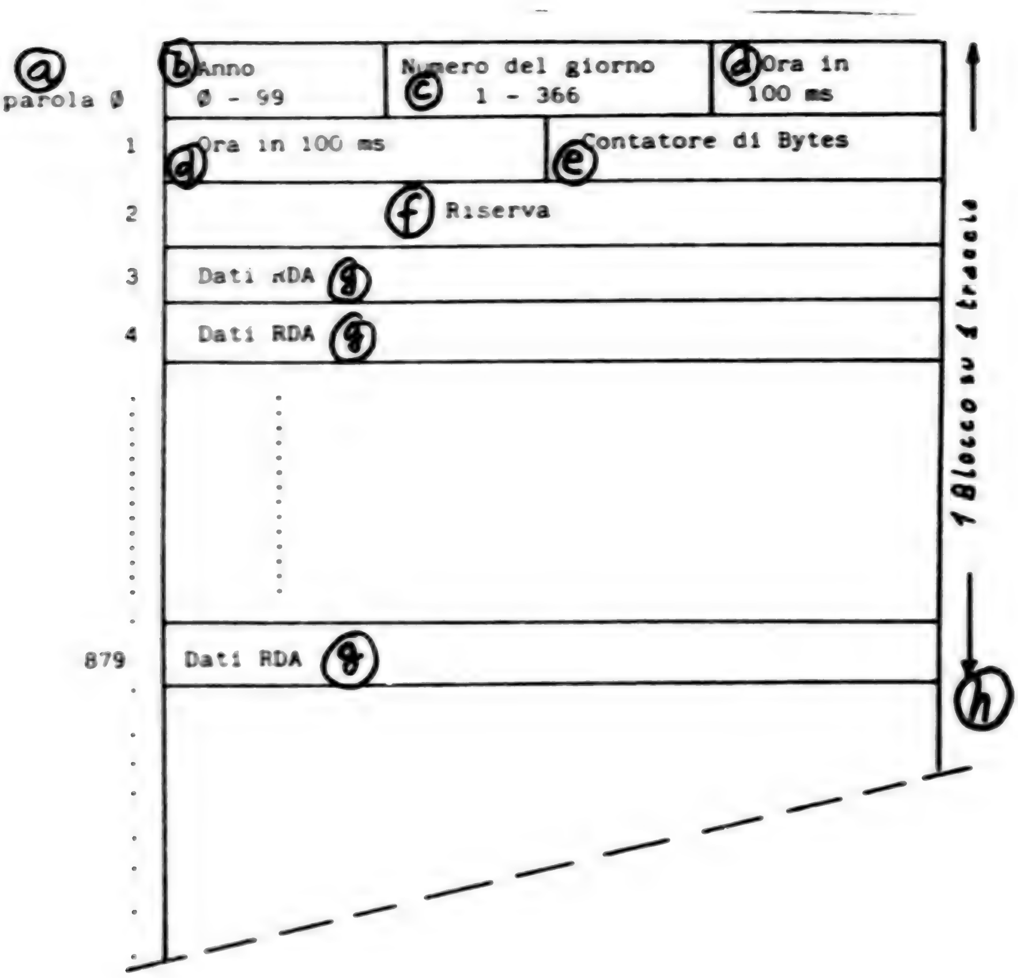


Figure 12. Structure of a data block for a call. Key: a--Word; b--Year; c--Number of days; d--Time in 100 ms; e--Byte counter; f--Reservation; g--RDA data; h--One block on one track.

3.3 Memorization of Data on Disc

The data phrases used and described in programs from which they can be retrieved are memorized by the system in a buffer pair in a central memory. These areas are used in tandem and they are dimensioned in such a way as to make optimum use of the disc; two buffers as a matter of fact occupy one track of the CRJ disc.

The program handles the transfer of data from the central memory to the disc, continuing up to the point when the area provided for the recording flow is complete or when all of the utilizer labels are described or finally when the flow on the part of the operator has been closed down.

After this has happened, the completed flow or the closed flow can be transferred on tape for processing by the computer center which takes care of the computation of the charges to be billed.

If, for some reason, the three regular flows are closed and none of the three of them were declared free for registration [recording], the system would continue the memorization of data on the auxiliary flow of the service disc.

This memorization is interrupted automatically when at least one flow of the CRJ disc is released and is declared free for recording; the system as a matter of fact closes the auxiliary flow down, it transfers it to the corresponding [flow] of the CRJ disc and starts memorization on the released rows.

It should be noted that the system is programmed in such a way as not to lose any CRJ data; as a matter of fact, if there is a case in which, in addition to the three regular flows, the auxiliary flow of the service disc must also be closed down, the CRJ and DRJ phrases are recorded in the two memory buffers until both of them are completed, in other words, they are tied in with them in such a way that they are no longer usable and, when they are fully used up, the system no longer accepts any calls.

4. Assumptions on Procedure for Approving a Numerical Automatic Switch

Checking out a numerical automatic switch for approval might be accomplished in the following three different phases:

(a) Hardware activation phase;

(b) Static checkout phase for system (or on-line checkout);

(c) Dynamic testing phase (or off-line testing).

This institute's switching and signalling laboratory is conducting an experiment to check out what we have just said. For this purpose we have set up a testing station to conduct tests of the first EDS centers installed in Turin and Milan. The testing station is made up of the following:

Two console teletypes with 100 baud conducting a dialog with the EDS exchange processing unit in Milan;

Two user teletypes with 50 baud, constituting two user stations remote from the EDS exchange in Milan;

One user teletype linked to the Pentatelex electromechanical exchange in Rome; a telephone service unit;

A Selenia GP 160 mini-processor equipped with:

Video [screen],
Fast Logabax printer,
Fast tape reader and punch,
Two Ampex magnetic tape units,
Two disc units at 5 Mbytes.

We will not describe phase (a) for hardware activation since it has little to do with the tasks of the switching operator.

4.1. Static System Checkout (On-Line)

It has been called static since it is done in the absence of traffic and since the purpose is to evaluate the output of the system by performing a whole series of tests that would not be possible in the presence of traffic. We must as a matter of fact put out of service some units of the system and analyze the performance of the entire center; we must cause the breakdown of the entire system; we must perform the initial system charge; we must check out the conversation between the various units and subunits; we must simulate breakdowns and have the system search, analyze, and possibly eliminate those breakdowns; we must reconstitute the system, etc.

This phase is carried out mostly from the console and we confine ourselves to a conversation between man and machine; the advantage here is that it can also be done in a remote fashion.

The EDS center is run from a console complex which can be used not only to get information on the state of the system and the peripheral units but also to vary that state. This kind of management is accomplished through the use of a series of "codes" which enable the computer to interpret the various requests, to read the corresponding fields, and to start the respective transmissions [emissions].

Concerning the centralized portion, we can thus obtain information on the configuration of the center, on the state of the central units, of the peripheral units, be they peripheral apparatus such as disc units, tape units, and system console, or the periphery on the side of the lines, including lines which are tied in to the operating console.

If we focus our attention on that part of the information items concerning the management of the lines and hence switching, we can obtain a considerable quantity of information items regarding the structure of the center from the external viewpoint--that is, single user lines, multiple stations, junction groups, makeup of groups, association of junctions with groups themselves, types of junctions, etc.

Concerning the structure of the center itself from the practical application software viewpoint and hence the in-house organization of the switching operation, we have the routing tree, the list of channels corresponding to a recognized prefix, the list of groups, the accessibility and possible sections added to the selection [dialing] recognized for the reconstruction of the selection [dialing] to be retransmitted, etc.

This type of information we might call "static" information since it is variable only through direct intervention from the operator's console; along with that we have a whole series of information items that be called "dynamic."

In this way we can check on the state of a line or of all lines in a group; we can have a list of all lines with fixed-start or fixed-stop polarity disturbances, or lines that are blocked on the incoming end or the outgoing end, or safety [backup] software, or, finally, all lines that are not tied in. In addition to all of these instantaneous information item transmissions [emissions], the center is thus able to transmit, on request, a series of data of the statistical type, with a time and day rhythm.

From the console, the operator can request the transmission of such data for one or more groups which he wants to check on, for a maximum of 24 groups simultaneously.

At an hourly rhythm, in addition to the number of connections made during the particular hour, the number of calls recognized incoming, the number of calls processed outgoing from the center, we can then obtain a series of information items for each of the groups being checked out, including the number of active lines, the number of fixed-start or fixed-stop trouble lines, etc.

Exchange traffic data pertaining to the entire day are furthermore transmitted at day-change time.

This fixed series of data can be joined by instantaneous information on the traffic handled by the exchange so that we are able to observe the exchange's work load; the main information items obtainable in this way pertain to the following:

Number of connections in progress,
Number of communications in buildup or release phase.

4.2. Dynamic Checkout (Off-Line Inspection)

On a statistical basis, we examine the data recorded by the center, both in a normal operating condition and under special simulated conditions.

We have seen the possibility of getting from the center--by using the operator's console--a really noteworthy volume of information items to check on the activity state and to check on the center itself as well as the lines tied in with it.

To complete the series of these information items, we still need a series of data summarizing the total traffic handled by the center, the type of traffic generated and in transit, whether and how this traffic has been generated and serviced by the center and what part of it has been properly handled.

To get this series of information items, we tried to process the considerable volume of data reported on disc and at the output of the center in the form of "rows" on tape.

The tapes are read by the miniprocessor model GP 160, while a properly developed program processes the data contained in the individual CRJ and DRJ phrases.

This is why we took a series of definitions as a point of reference.

Duration of a connection: time interval between the instant of call recognition and the instant of calling line release;

Duration of connection build-up:

*For successful connections: time interval between instant of call recognition and instant of connection signal recognition (or forwarding [processing]).

For the r-mo connection:

$$(1) \qquad D_r = (C2)_r - (C12)_r \quad \text{if } (C2)_r > (C12)_r$$

or:

$$(2) \qquad D_r = 24 + (C2)_r - (C12)_r \quad \text{if } (C12)_r > (C2)_r$$

We must keep in mind that, out of field C2, we must take only the 16 bits which are least significant (the last ones), with C2 and C12 constituting two homogeneous magnitudes but with different degree of definition.

*For unsuccessful connections:

Time interval between instant of call recognition and instant of recognition (or processing) of release signal.

From the two definitions given above we can get the value of the average duration of building up a connection within a span of 24 hours.

$$(3) \qquad \overline{D}_{TE} = \frac{\sum D_r}{N_E}$$

where N_E represents the number of calls between midnight of one day and midnight of the next day.

Average Duration of Connection:

Time interval between instant of call recognition and instant of release signal recognition.

For successful connections:

$$(4) \qquad D_{cr} = (D2)_r - (C12)_r$$

or:

$$(5) \qquad D_{cr} = 24 + (D2)_r - (C12)_r$$

under the usual conditions; we furthermore must keep in mind that D2 is homogeneous with C2 so that the earlier observations still apply.

For unsuccessful connections, we have the following:

$$(6) \qquad D_{cr} \equiv D_r$$

where D_r is calculated as in 1 or 2.

From the definition of D_{cr} we can tell that the average duration of connection build-up over a period of 24 hours is:

$$\bar{D}_c = \frac{\sum D_{cr}}{N_E} \qquad (7)$$

where N_E has the meaning defined in the preceding point.

Traffic in Groups

Traffic in outgoing groups

Let group F_i be made up of N_i junction lines (outgoing). Let N_i be a plant parameter.

Assuming that, at a certain time of day (0, 1, 2--23) line N_r $(0 \leq r \leq s)$ of line group F_i is taken up for x_r minutes of use, we define the traffic of group F_i as follows:

$$A_{i,h} = \frac{\sum_{0}^{s} x_r}{N_i} \cdot \frac{1}{60} \qquad (8)$$

where h = 0, 1, 2--23, pertaining to the time of day h and where:

$$x_r = (D4)_r - (C13)_r \quad \text{if } (D4)_r > (C13)_r \qquad (9)$$

or:

$$x_r = 24 + (D4)_r - (C13)_r \quad \text{if } (D4)_r < (C13)_r \qquad (10)$$

for successful connections.

For unsuccessful connections we have the following:

$$x_r = (C2)_r - (C13)_r \quad \text{if } (C13)_r < (C2)_r \qquad (11)$$

or:

$$x_r = 24 + (C2)_r - (C13)_r \quad \text{if } (C2)_r < (C13)_r \qquad (12)$$

Traffic on Incoming Groups

Let line group N_j be made up of N_j junction lines (in-coming). Let N_j be a plant parameter.

In analogy to what we described for traffic on outgoing groups, we have the following:

$$(13) \qquad A_{j,h} = \frac{\sum_{0}^{5} r\, x_r}{N_j} \cdot \frac{1}{60}$$

where:

$$(14) \quad x_r = (D4)_r - (C12)_r \ \textbf{if}\ (C12)_r < (D4)_r$$

or:

$$(15) \quad x_r = 24 + (D4)_r - (C12)_r$$

$$\textbf{if}\ (D4)_r < (C12)_r$$

What we said above applies to successful connections. The following however applies to unsuccessful connections.

$$(16) \quad x_r = (C2)_r - (C12)_r \ \textbf{if}\ (C12)_r < (C2)_r$$

or:

$$(17) \quad x_r = 24 + (C2)_r - (C12)_r$$

$$\textbf{if}\ (C2)_r < (C12)_r$$

Line Group Efficiency

Let us define the efficiency of a line group F_i (outgoing) as the ratio between the number of successful connections and the number of calls processed on them.

$$(18) \qquad E_i = \frac{\sum N_{CBF}}{\sum N_{CHTE}}$$

The bit 0 of field C2 indicates whether the call was successful (bit 0 = 0) or whether it was unsuccessful (bit 0 = 1).

Peak Traffic

This parameter is very important for an inspector since it makes it possible to check on the correct dimensioning of the component parts of the exchange, so as to guarantee satisfactory service to the user. The method we propose differs from the recommendations of CCITT on that score and, although it does not yield any different results, it on the contrary offers the possibility of better definition (detailed to the first minute, rather than the quarter hour):

We consider the number of calls, minute by minute, and within a span of 60 successive minutes. The traffic during that hour can be figured out by making reference to the average duration of the connection calculated as seen earlier; that figure might be A_0.

The number of calls in the successive minutes, we assume, may be added to that of the preceding 59 minutes; the corresponding traffic value would be A_1.

Since we used N_i for the number of calls at the i-th minute, the traffic volume A_0 serviced by the center during the first 60 minutes will be:

$$(19) \qquad A_0 = \bar{D}_c \sum_{0}^{59}{}_i \, n_i$$

And analogously:

$$(20) \qquad A_1 = \bar{D}_c \sum_{1}^{60}{}_i \, n_i$$

$$\vdots$$

$$(21) \qquad A_r = \bar{D}_c \sum_{r}^{r+59}{}_i \, n_i$$

The relationship which links the A_r (with r being any number but > 0) therefore is of the following type:

$$(22) \qquad A_r = A_{r-1} + \bar{D}_c (a_{r+60} - a_{r-1})$$

Developing equation (7) as a matter of fact, we get the following:

$$(23) \qquad A_0 = \bar{D}_c (n_0 + n_1 + \dots + n_{59})$$

$$(24) \qquad A_1 = \bar{D}_c (n_1 + n_2 + \dots + n_{59} + n_{60})$$

and hence:

$$(25) \qquad A_1 = A_0 - \bar{D}_c n_0 + \bar{D}_c n_{60}$$

or also:

$$(26) \qquad A_1 = A_0 + \bar{D}_c (n_{60} - n_0)$$

Analogously:

$$(27) \qquad A_2 = A_1 + \bar{D}_c (n_{61} - n_1)$$

Proceeding inductively, we generally have the following:

$$A_r = A_{r-1} + \bar{D}_c(n_{r+59} - n_{r-1}) \tag{28}$$

Which precisely expressed equation (22).

The maximum of the A_r within a span of 24 hours examined represents the maximum traffic hour [time] and gives us the relative value for it.

To give equation (22) a more immediate form, it is necessary to transform it in such a manner as to permit an expression in terms of traffic hours (that is to say, Erlang).

Thus setting up:

$$\bar{\bar{D}}_c = \frac{\bar{D}_c}{3600} \tag{29}$$

Equation (22) is transformed into the following

$$A_r = A_{r-1} + \bar{D}_c(n_{r+59} - n_{r-1}) \tag{30}$$

Starting with the definitions given above, we processed the tapes, organizing the data so as to obtain:

A series of tables showing traffic on incoming and outgoing line groups whose data represent the hours [time] of occupation of lines belonging to each group in the individual hours of the day.

A table indicating the efficiency of the groups during the individual hours of the day;

The average duration of building up a connection, calculated as the ratio between the sum of corresponding durations and the total number of recognized calls;

Average duration of a connection calculated as the relationship between the sum of the corresponding durations and the overall number of calls recognized;

For the peak traffic, we have an indication here of the minute as of which the maximum number of calls was recognized within an interval of 60 successive minutes and the corresponding traffic volume as a product of the number of such calls multiplied by the average duration of a connection;

Type of traffic: the calls were subdivided, on the basis of the type of selection [dialing] recognized, as follows: local, national (toward a national junction), international; the product of these numbers of calls by the average duration of a connection will give us the values for the types of corresponding traffic;

Successful and unsuccessful connections: here we have a direct report of the values from the corresponding call counters;

Degree of network loss: the figure given out represents the ratio between the number of unsuccessful calls and the total number of calls recognized;

Direct traffic and overflow traffic: here we directly get the figures from the counters on the call routed either directly or via detour;

Fictitious traffic: we consider all of the calls which were unsuccessful to be fictitious traffic. They are subdivided into four headings, grouping the cases of disconnection [release] relative to the connection build-up phase on the incoming side or the outgoing side and further distinguishing the causes due to the line (or the remote exchange or the user) from those due to the center.

We must keep in mind that the most varied reasons, which may bring about and consequently cause fictitious traffic on the network, must be better detailed, so as to permit a very thorough qualitative and quantitative analysis.

Combining the most disparate causes, which bring about fictitious traffic at the exchange's input, would often not enable us to come up with an objective judgment and hence with the proper kind of corrective action. The case in which, for example, the user does not dial within the proper time or does not dial correctly, is different from the case where the caller is disconnected following the determination, by the center, that it does not have means available for handling that call.

This will be the subject of a second phase of experimentation which is now being prepared.

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